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ON EASTERN EUROPE

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INTRODUCTION

This is a serial publication containing selected translations on all categories of economic subjects and on geography. This report contains translations on subjects listed in the table of contents below. The translations are arranged alphabetically by country.

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BULGARIA

An Evaluation of the Utilization of Productive Capacities in Industry

[This is a translation of an article by Totyu Totev in Izvestiya na Visschiya Finansovo-Stopanski Institut Svishtov, Vol XII, No 3, July-September 1959, Svishtov, pages 268-287; CSO: 3770-N/a]

The tremendous growth of industrial production, called for by the original directives accepted by the Seventh Congress of the Bulgarian Communist Party, must be fulfilled in its greatest part (60 percent) through the improvement of the exploitation possibilities of the existing technology. This task, enormous in scale, is based on the possibility of using a considerable part of the hidden reserves of the socialist economy. This requires that the work of the industrial enterprises be organized in such a way as to increase, through respective organizational-technological undertakings, the volume of the productive capacities without further capital investments, solely by improving the rate of their utilization. Thus the economic leap forward in the field of industry, together with several other questions in the field of the economies of industrial enterprises, is closely connected with the problem of the productive capacities as well.

The organization of the more complete and rational utilization of the productive capacities in industry assumes above all their correct calculation by applying a correct and uniform methodology. Forther on, the application of some other undertakings concerning their expansion without any new construction and the improvement of the rate of their utilization must be preceded by a thorough and scientific economic analysis. It must be based on a system of methodologically sound indicators which will fully and correctly show the managements of industrial enterprises how much and in which fields success has been registered and how many mistakes have been allowed in the utilization of the productive capacities.

This analysis, in order to become an important decisive tool in the hands of the economic leaders, must be as complete and concrete as possible, and it must be based mainly and above all on the existing system of accounting without

requiring any additional data hindering the analytic-accounting work. One of its main requirements, based on the everyday needs of the economic leadership, is that it be operational, and that it be carried out not only at the end of the year or at the end of the half-year, but also at the end of each month for the entire enterprise, as well as the individual departments and even the individual types of machines.

In most of our industrial enterprises the question of the correct calculation and evaluation of the utilization of the productive capacities is not solved satisfactorily. First of all, there is no uniform methodology for calculating the volume of the productive capacities for a given plan period. Methodological mistakes are frequently made in calculating the volume. Also there are great variations in the indicators which are designed to characterize the degree of utilization of the productive capacities. The incorrect calculation of the volume as well as the degree of utilization of the productive capacities does not permit a correct evaluation of the extent of utilization of the reserves in the industrial enterprises for the expansion and fuller utilization of the capacities.

The reasons for this state of affairs must be sought first of all in the fact that precisely these questions are not sufficiently clarified in our economic literature. Much more is usually written about the directions in which the reserves for improvement of the utilization of the productive capacities should be sought, which is, of course, necessary and useful, but it is not sufficient. In the second place, the superior organizations also have done very little. Therefore, the industrial sections of the okrugs people's councils and the Committee on Industry are faced with these still unsolved tasks.

In this work we shall try to clarify some questions of the analysis on the utilization of the productive capacities. This, however, requires also the preliminary discussion of some questions on the calculation of their volume.

II

The productive capacities are measured by the maximum quantity of output of a given assortment and quality which

can be produced by the entire existing or planned industrial-production equipment and production areas of the enterprise using the given raw and other materials, with the most up-to-date technology and organization of labor and with the most progressive technical norms and the fullest possible utilization of the working time. They are calculated for the entire enterprise as well as for the individual departments, automatic lines and aggregates, and even for the individual types of machines. When these calculations concern the enterprise as a whole, or the individual departments, the output which can be produced by the total elimination of the bottlenecks must be considered. Precisely for this reason, the new technological improvements of the machines and equipment to the extent that they are directed toward the liquidation of bottlenecks, are not considered as changing the volume of the productive capacities of the enterprise as a whole.

When calculating the productive capacities, the entire equipment of the enterprise at a given moment must be considered, regardless of the fact that part of it—for various reasons, such as repair, delay in installation, breakdowns, etc. is not actually operating. In this respect, an exception must be made only when industrial enterprises are equipped with automatic lines and some equipment and machines must be kept in reserve in order to maintain the regular work in case of breakdown, etc.

In calculating the productive capacities on the basis of the plan, we must consider the average yearly number of machines by taking into account the number as well as the time spent for installing new machines or for discarding old ones. In computing the productive capacities on the basis of the accounting data, the changes in the number of machines are taken into consideration only to the extent that they affect the average annual number of machines used, excluding the deviations in the time spent for installing and dismantling machines. This change in the method of establishing the average yearly number of machines—which method should be used only in determining the productive capacities—will involve the enterprises in a struggle to install and use new machines ahead of schedule as well as using old machines as long as possible. The practical determination of the volume of the productive capacities is also connected with a given assortment and quality of produced output. In calculating on the basis of the plan, the planned assortment must be taken into consideration and in calculating on the basis of the accounting reports, the accounting assortment must be con-

considered. Of course, in accounting for the degree of their utilization when the actual structure of production changes as compared with the planned one, the influence of the structural factor appear and must be taken into consideration during the analysis and eliminated. The literature refers to the so-called optimal assortment as a basis for computing the productive capacities.

The planned as well as the actual assortment of the realized output are closely connected with the needs of society at a given moment. A particular structure of production is worked out not only in order to obtain a larger output but mainly in order to satisfy to the maximum the needs of society, which, especially under socialism, change rapidly and substantially. Moreover, the planned and actual assortment also reflect a given state of specialization and cooperation of the enterprises. We think that the annual calculations of the volume of the productive capacities must be based precisely upon the... The utilization of the optimum assortment has a definite meaning and importance in elaborating proposals for some reorganization or rearrangement of enterprises of a given branch on a national scale, etc.

The calculation of the productive capacities for the entire enterprise as well as for the individual departments is connected with the application of technical norms for the machine-time for the production of a unit of output. These norms must be the most progressive ones that have been lastingly achieved in the particular branch or enterprise, if its top achievements surpass the achievements of the branch. In many plants the planned norms assigned by the plant producer to the equipment used is usually taken. Practise shows, however, that these norms are not only reached in one or two years but are also greatly surpassed.

An additional question arises in connection with the application of the most progressive norms: if during the accounting year the most productive workers in the enterprise obtain lasting achievements which surpass the most progressive norms, used as a basis for computing the productive capacities, should corrections be made in volume of the latter at the end of the year?

The most progressive norms formerly used, which are surpassed by the lastingly obtain top achievements should, of course, be changed. Or, the most progressive norms should be those which have been obtained by the most productive workers.

However, corrections should not be made at the end of the year in the volume of the productive capacities as a result of changes in the progressive norms, in our opinion, because of the following two reasons: first, these norms have been achieved in the course of the discussed accounting period; thus during that period they were still in the process of consolidation as a lasting achievement; secondly, this will mobilize the leadership of the enterprise as well as the entire workers' collective in their fight to obtain new progressive norms. These successes must improve the degree of utilization of the productive capacities. This will be achieved if the newly obtained progressive norms are taken into consideration, not during the accounting but during the subsequent planning period.

The computed productive capacities, as was already pointed out, express the maximum possible production of the individual industrial enterprise, department, sector, line, aggregate, or individual type of machine. In order to obtain this, the computation must be made on the basis of the most progressive norms which have been lastingly obtained in the branch or enterprise. In making these calculations, the entire output must be included and measured. As a general rule, the uniform homogeneous output is expressed in natural measures; however, this is possible for only an extremely limited number of products. The great variety of industrial products requires an approach to the output that would make it comparable. Usually the use of value measurements is not appropriate in this case. Therefore, conditional natural measurements are used. The individual types of products produced by the enterprise are reduced to one, which serves as a unit. The machine time is used as a basis for elaborating the correlating coefficients. Thus, for example, the "Mashstroy" state machine-building plant in Troyan produces the following types of products: 1,000-millimeter band saws, "Pirin" winches and electric winches, "Pirin" small transport cars, "Pirin" holding carts, and planers with mounting apparatus. The following machine in hours is needed for the production of a unit of the above products, applying the most progressive norms: 1,000-millimeter band saws--495, "Pirin" winch--1,710, "Pirin" electric winch--806, "Pirin" small transport cars--388, "Pirin" holding car--120, and planer with mounting apparatus--329. We assume that the "Pirin" winch is the most typical product and has the largest relative share in the total volume of production. It is used, therefore, as a conditional natural measurement. The correlating coefficients for the remaining products will be obtained as follows:

- a) 1,000-millimeter band saws--495:1,710 = 0.2895
- b) "Pirin" electric winch--806:1,710 = 0.4713
- c) "Pirin" small transport car--388:1,710 = 0.2269
- d) "Pirin" holding car--120: 1,710 = 0.0702
- e) Planer with mounting apparatus--329:1,710 = 0.1924

In determining the volume of the productive capacities in the enterprise as a whole, one starts with the capacities per department--that is, with the maximum amount of output which the individual departments can produce--and within the departments with that of the individual types of machines. If each department produces a completely finished product, the sum-total of output of all departments will give us an idea of the productive capacities. If, however, we deal with an output which has a detailed processing, as is typically the case in machine-building, then the productive capacity of each department will be computed in natural or conditional units, which, technologically, must be produced in the individual links and on individual types of machines. In making such computations, it usually happens that the various departments produce different amounts of maximum output. However, the volume of output which may be produced by the basic and decisive departments is taken as the productive capacity of the enterprise. Thus, for example, such departments in machine-building enterprises are the machining and the assembling departments.

The computations for determining the maximum possible production obtained by the individual departments and types of machines are complicated by the variety of output. Thus, for example, if the "Pirin" winch is considered the most characteristic product to which the remaining products of the machine-building plant in Troyan are correlated, the correlating coefficient for the planer will be 0.1924. Yet, while of the 1,710 machine-hours needed for a "Pirin" winch, 48.3 percent must be used by the assembling department, only 32.9 percent of the 329 machine hours will be used by that department for the planer. Or, if the enterprise should produce only "Pirin" winches, 826 machine-hours of work will be needed by the assembling department per unit of conditional output, and 562.6 machine-hours if it should produce only planers. Therefore, under one kind of structure of production, the produced capacities of the mounting department will be, let us say, 1,000 conditional units, and under a different structure, using the same existing technique, the same technology, and the same progressive norms, these capacities will be considerably smaller or greater. It is therefore necessary

to calculate the productive capacities of the enterprise as a whole and per department under a strictly defined structure of production.

Let us assume that the "Mashstroy" state machine-building plant in Troyan had the following planned production program for 1960:

1,000-millimeter band saws--150 units

"Pirin" winches--100 units

"Pirin" electric winches--100 units

"Pirin" small transport cars--100 units

"Pirin" holding cars--200 units

Planers with mounting apparatus--250 units

The machine time, in hours and in progressive norms, needed for the production of one unit of each products is distributed per department as follows:

Table I

Product	Machine Hours Required	Machine-Time Required			
		Unit	per Unit, per at Department	Prog-ressive	Ma- chines
		Norms	ing	ing	ing
1,000-millimeter band saw	495	278	13	150	54
"Pirin" winch	710	267	91	526	826
"Pirin" electric winch	806	303	95	220	461
"Pirin" small transport car	388	16	40	183	159
"Pirin" holding car	120	10	10	44	65
Planer with mounting apparatus	329	119	94	98	108

On the basis of the above plan structure, the average machine-time required at progressive norms may be calculated for the production of one unit of output as a whole as well as for the individual departments. In this case it is not the average total time that counts but its distribution per department. These computations may be made on the basis of the following table:

On the basis of the above table, the following distribution of machine time may be calculated for the individual departments:

Table 2
Planned Production and Machine-Time Required for the
Planned Production of the Conditional Product

Product	Planned Units	Machine Time per Unit, at Prog-ressive Norms
1	2	3
1. 1,000-millimeter band saw	130	495
2. "Pirin" winch	100	1,710
3. "Pirin" electric winch	100	806
4. "Pirin" small transport car	400	388
5. "Pirin" holding car	200	120
6. Planer with mounting apparatus	250	329

Product	Planned Units	Machine-Time Required for the Planned Production per Department						Number of Condi- tional Products
		Press- ing	Machin- ing	Assem- bling	9	9	9	
1	4	5	6	7	8	9	9	9
1	74,250	41,700	1,950	22,500	8,100	43,421		
2	171,000	26,700	9,100	52,600	82,600	100,000		
3	80,600	3,000	9,500	22,000	46,100	47,135		
4	155,200	2,400	16,000	73,200	63,600	90,760		
5	24,000	200	2,000	8,800	13,000	14,035		
6	82,250	29,750	1,000	24,500	27,000	48,099		
[Total]	587,300	103,750	39,550	203,600	240,400	343,450		
Average*	1,710	302	115	593	700			

*Average machine-time required for one conditional product per department

Or, under the planned structure of production, the following machine-hours per department are required per unit of conditional product: by the casting department--302, the pressing--115, the machining--593, and the assembling--700. On the basis of these average figures per conditional product

are calculated the units which each department can produce as a maximum. The above-mentioned calculations, however, have to be made not only per department, as shown in Table 2, but also within the departments and per individual types of machine. We have done this in Table 3 only for the machining department, as that department is decisive in the calculations of the productive capacities for the discussed enterprise.

Table 3

I = Per unit; II = Total for the planned amount

A = Hours; B = minutes

Types of Machines	Norm Time per Type of Product Based on Progressive Norms				
	I	A	-B	II	A
1	2	3	4	5	
1. Cutting machine tools	0.2	0.65	-	312	30
2. Lathes	89	29	-	13,422	30
3. Milling machines (cutters)	18	15	-	2,737	30
4. Planers	24	05	-	3,612	30
5. Shaping machines	10	38	36,6	1,595	-
6. Polishing machines	5	08	-	770	-
7. Bolting machines	0	20	-	50	-
8. Total	150	-	-	22,500	-

Norm Time per Type of Product Based on Progressive Norms

	Electric "Pirin" Small				Electric "Pirin" Winch				Transport Car			
	I	II	A	B	A	B	A	B	A	B	A	B
1	6	7	8	9	10	11	12	13	14	15	16	17
1	16	18	1,630	-	12	42	1,270	-	7	11	2,873	20
2	330	15	33,025	-	106	32	10,653	20	96	03	38,420	-
3	107	07	10,711	40	89	35	8,958	20	57	38	23,053	20
4	16	11	1,618	20	-	-	-	-	-	-	-	-
5	14	35	1,458	20	4	06	410	-	17	08	6,853	20
6	15	28	1,546	40	0	40	66	40	2	-	800	-
7	26	06	2,610	-	6	25	641	40	3	-	1,200	-
8	526	-	52,600	-	220	-	22,000	-	183	-	73,200	-

[table continued]

[Table 3 continued]

	Norm Time per Type of Product Based on Progressive Norms "Pirin" Small Planer with Mount- Holding Car ing Apparatus												Machine Hours Required in the Machin- ing De- partment for the Planned Program	Machine Time in the Ma- chining Depart- ment for at Condi- tional Total Product and per Group of Machines	Machine Hours Required in the Machin- ing De- partment for the Planned Program			
	I		II		I		II		I		II							
	A	B	A	B	A	B	A	B	A	B	A	B						
1	18	19	20	21	22	23	24	25	26	27	28							
2	2	24	480	-	1	59	495	50	7,063	20	34							
3	25	42	5,140	-	36	03	9,012	30	109,673	319	20							
4	12	51	2,570	-	13	13	3,304	10	51,335	149	28							
5	-	-	-	-	20	20	5,083	20	10,314	30	02							
6	2	-	400	-	23	-	5,750	-	16,466	47	57							
7	1	03	210	-	3	10	791	40	4,185	12	11							
8	-	-	-	-	0	15	62	30	4,564	13	17							
	44	-	8,800	-	98	-	24,500	-	203,600	592	-							

Knowing the time required for the production of a unit of conditional product per department and within the department, also per type of machine, it is easy to calculate the productive capacities of the enterprise as a whole per individual links and types of machines.

A decisive role in the computation of the productive capacities is played by the time during which the equipment is to be used to the maximum. In this connection, the economists are of different opinions. Some of them think that this time must be the so-called regime of work applied in the enterprises. Or, the so-called regime fund should be taken as a basis for the calculations. This is obtained by deducting from the calendar fund for the year the holidays and the non-working days and by multiplying the remaining working days by the number of hours per shift. However, the regime fund calculated in this manner does not reflect the maximum possible time during which the machines and equipment could be used. Some authors think that it is advisable to calculate the regime of work for each branch centrally, and thus the

basis for computation of the productive capacities in relation to the time will be equal in all enterprises.¹ But even if this is done, it is not unusual under the new conditions of the struggle to fulfill the Five-Year Plan ahead of schedule, that industrial enterprises with a two-shift regime of work introduce a three-shift work in some of the work sectors which are bottlenecks. In such cases, [the question is] in what way have the three-shift sectors increased their productive capacities?

In computing the productive capacities, the regime fund cannot and should not be taken as a basis because "...it will not characterize, in all cases, the maximum capacities of the enterprise in terms of output--i.e., its productive capacity--but will characterize only the possibility of using these capacities under the conditions of a given regime of work."² Therefore, the time during which the machines and equipment can be used should be calculated as the calendar fund minus the time which must be used for current and basic repairs, for planned repairs, or for introducing preventive inspection. This is indeed the time which must be considered as the maximum possible time for work of the machines and equipment, because experience shows that "...the means of production can be used during the entire 24 hours and during the entire year, not only in the branches with uninterrupted production processes but also those with interrupted production processes."³

In planning and accounting experience of the enterprises the question arises of when the productive capacities should be computed and at what intervals. "By itself, the magnitude of the productive capacities is a dynamic indicator...but it does not need frequent checking when it is determined with the help of the above factors. It is determined for three to five years and only in case of changes in the conditions of production (introduction of considerable quantities of new equipment and considerable changes in the specialization of the enterprise) can it be reviewed at shorter intervals."⁴

We consider this statement unacceptable. The improvements in technology are proceeding at rapid pace and this also affects the volume of the productive capacities. Thereby, if for some correction will be required in the operational as well as the annual analysis of the plan-determined productive capacities, depending upon the structure. This may be seen from the example elaborated above. Therefore, we think it useful and necessary to calculate the volume of the productive

capacities in the individual enterprises at the beginning of each plan year, whereby at the end of the year respective corrections can be made in connection with some objective factors such as the introduction of new equipment and new technology, as well as because of the impact of the changes upon the structure of production.

III

While the productive capacities express the maximum output which can be produced by the enterprise, department, sector, or group of machines, the effectiveness of their utilization is measured by the output which has been planned or is actually produced. The ratio between the planned or the produced output and the actual productive capacities expresses the degree of their utilization. The level of utilization of the productive capacities will be higher the larger is the volume of the planned or actually produced output. The latter is determined by two factors: a) by the time of utilization of the equipment, and b) by the results obtained by the equipment per unit of time. Therefore, in studying the degree of utilization of the productive capacities, the study has to be made in two directions: first, with regard to the time during which they have been used--i.e., with regard to the extent of their use; second, with regard to their output per unit of time--i.e., with regard to the intensity of their use.

The basic requirement for studying the extent of use of the productive capacities is that it be made not only for the enterprise as a whole but also for the departments and the different types of machines. This is necessary because their volume is also determined not only for the enterprise and the departments but also for the types and groups of machines.

The following [categories of] funds are used in our literature for characterizing the utilization of the machines: calendar fund, regime fund, planned fund, and actual fund. The regime fund is obtained by deducting from the days of the calendar fund the holidays and other non-working days, and by multiplying the remainder by the hours worked according to the number of shifts.

The planned fund reflects the planned work shifts during the plan period, the time necessary for all kinds of repairs and inspections, as well as the lack of coordination between

the individual characteristics of each group of machines and the degree of utilization of individual groups of machines. For example, a given machine or a group of machines may be able, under the practiced regime of work, to operate for more machine-hours, but because its production is determined by another group of machines, it is necessary to plan its utilization in machine-hours below those possible under the given conditions.

The actual fund, as its very name shows, reflects the actually worked machine-hours per group of machines and is determined by the regime of work, the time actually spent for repairs, and the lack of coordination during the actual fulfillment of the production program in the accounting period of the individual types and groups of machines.

In computing the actual fund, some authors suggest subtracting the hours spent on output which has been subsequently rejected, or on correction of defects, as well as the hours employed additionally to make changes in the technological process regardless of the reasons. We think that the study of the hours worked is not a matter of the extent but the intensity of utilization. Therefore, the question of how the worked time has been used, including the spent time on rejected output, correcting of defective output, and deviations in technology are matters for analysis of the intensity of utilization of the productive capacities.

The extent of utilization is most often characterized by the relationship between the plan or actual fund and the regime fund. This is the indicator which characterizes the utilization of the regime fund. This indicator does not, however, express the planned or actual degree of utilization of the productive capacities. It gives an idea of the extent of utilization, but under fixed, concrete conditions of work in the enterprise, department, sector, or group of machines. Of course, it also has a meaning and importance of its own and permits comparative studies between the individual enterprises with regard to the utilization of the regime fund.

In our opinion, the most exact idea of the extent of utilization of the productive capacities can be obtained by comparing the plan or actual fund with the fund of the possible utilization time--i.e., to the fund from which the productive capacities are computed. This is the true indicator of the extent of utilization of the productive capacities.

Some authors propose that, in computing this indicator, the plan or actual fund should be compared to the calendar fund; this would not be correct, as it is not the calendar fund which is at the basis of the computed productive capacities. If we accept the calendar fund for determining the productive capacities, minus the time required for repairs, then it is logical that we should also take the same fund as a basis in the study of the utilization, and this is the possible utilization time.

The possible utilization time is the calendar fund, reduced by the non-working days and holidays as well as by the time required for basic, current, and planned repairs and preventive inspections. Thereby, the time necessary for all types of repairs and inspections is computed by applying the most progressive norms for between repair intervals and for the duration of their fulfillment, regardless of the fact that these norms are not used in the elaboration of the planned fund.

Keeping in mind what was mentioned above concerning the indicators characterizing the extent of utilization of the productive capacities, let us demonstrate their computation with symbols.

Using the following symbols:⁶

F_{pwt} = possible working time [fund]

F_r = regime fund

F_{pl} = plan fund

F_a = actual fund

The indicators of the extent of utilization will be computed as follows:

a) the planned indicator of the extent of utilization of the productive capacities is:

$$\frac{F_{pl}}{F_{pwt}}$$

b) the actual indicator for extent of utilization is:

$$\frac{F_a}{F_{pwt}}$$

And the indicator of extent of utilization of the productive capacities under specific conditions, or the indicator of utilization of the regime fund, will be equal to:

a) the planned [indicator]:

or the extent of utilization of the planned fund, F_{plo} , which is to be calculated by the formula:

or the extent of utilization of the regime fund, R_{fo} , which is to be calculated by the formula:

b) the actual [indicator]:

or the extent of utilization of the actual fund, F_{fi} , which is to be calculated by the formula:

The so-called indicator of the actual utilization of the planned fund represents a special interest of great practical importance. This indicator shows to what extent the planned utilization of the productive capacities is being fulfilled, overfulfilled, or underfulfilled. It must be computed in percentages, since there can be an overfulfillment of the planned extent of utilization of the productive capacities as a result of a reduction in time for the different types of repair work, lengthening of the intervals between repairs, above-plan utilization, etc. of and daily excesses with regard to the planned utilization of the productive capacities.

Keeping in mind the above symbols, this indicator will be equal to:

$$\frac{F_{fi}}{F_{plo}} \times 100$$

In computing the above three indicators (for the extent of utilization of the productive capacities, for the utilization of the regime fund, and for the utilization of the plan fund, as per accounting data), it must be taken into consideration that the possible working time, the regime, and the plan fund must be computed on the basis of the actual data. This means that the actual data on the annual average number of the individual types of machines must be taken into consideration. As for the regime fund, the actual number of shifts must also be considered. This is necessary in order to ensure the comparability of the data and to allow exact and correct conclusions about the achievements and weaknesses in the utilization of the productive capacities.

15

The indicators of the extent of utilization of the productive capacities also reveal the lack of coordination between the individual types of machines in the enterprise, which is expressed by the difference between the highest and lowest indicators of the extent of utilization of the individual types of machines. The smaller this difference, the more evenly is the work-load of the individual types of machines distributed, regardless of whether their total load is low or high, and vice versa. A great difference shows, on the other hand, that there is a serious lack of coordination in the productive capacities of the individual types of machines.

One cannot consider lack of coordination as an organic shortcoming of the socialist industrial enterprises. Even the most modern plants, equipped with the most modern machine technology, whose productive capacities are fully coordinated, may show a certain lack of integration as a result of several technical improvements which lead to an increase in the volume of the productive capacities of individual sectors. The leadership of the enterprise must take the necessary measures to overcome this on time. There are possibilities in this direction. They are expressed in outlining and carrying out new undertakings to increase the productive capacities of the sectors which are bottlenecks, through specialization and coordination of the production with that of other enterprises. During the present stage of the struggle for a fuller utilization of the existing technology, in connection with fulfilling the Five-Year Plan ahead of schedule, it must be considered, in characterizing the results of the work of the individual industrial enterprises, the achievements in overcoming the lack of integration of the machines and equipment. For this purpose, the deviations in the indicators of the extent of utilization of the different types of machines according to accounting data must be compared with those based on the plan and of the preceding year.

In order to uncover the reserves for improving the extent of utilization of the productive capacities, it is of great importance to study the work stoppages of the individual types of machines according to departments. These evaluations are made by comparing the regime with the plan fund. The difference between the regime and the plan fund gives us an idea of the planned stoppages. They may be due to basic and anticipated repairs as well as to some preventive inspections. Moreover, it is sometimes necessary to plan stoppages because of the lack of integration of the machines. The planned stoppages, representing the difference between the regime and the

the planned stoppages equivalent to regular and auxiliary plan fund, must be compared with actual one--i.e., with the difference between the actual and the regime funds according to the accounting data. These comparisons may be made with regard to the structure of the difference in either percentual figures or absolute figures. The first study, based on the structure in percentual figures, permits comparative evaluation between individual enterprises of the same kind. The second, based on the absolute difference, is important for a direct revelation of the loss resulting from stoppages. In this case, however, the absolute actual difference should be compared with the difference between the regime fund in the accounting data and the corrected plan fund. This is necessary in order to eliminate the impact of the deviations between the planned and the actual annual average number of the individual types of machines.

In making such studies the stoppages must be placed in two groups: planned and unplanned. The first must be studied with a view to finding out to what extent they are within the framework of the planned reserves, while the second must be broken down according to causes and responsible agents. The non-planned stoppages may be the result of a breakdown repair--basic and current; lack of workers; lack of prepared work, such as drafts, planning of tasks, technological maps, etc.; lack of materials, tools, power, etc. Almost all of these causes are the result of poor organization in the enterprise and may therefore be eliminated. The non-planned stoppages, grouped according to causes, and the lengthening of the planned stoppages in hours may be measured in conditional units of output. These units, compared in percentual figures with the productive capacities, give us an idea of that part of the existing reserves which may be used most easily. Of course, there are substantial reserves with regard to the reduction of the planned stoppages and especially those caused by the lack of integration of the machines.

The detailed analysis of the extent of utilization of the productive capacities also requires a study of the degree of participation of the equipment in the process of production. In connection with this participation, the industrial production equipment is divided into three groups: a) available, b) installed, and c) actually in operation. Of course, in this case the annual average, quarterly average, and monthly average amount of equipment according to these three groups are taken into consideration. The portion of the existing non-installed machines and equipment represents entirely a reserve which may be used during the subsequent planning.

period. The portion of installed equipment which has not been in operation is also such a reserve. This reserve in inadequate utilization of the equipment--that not installed and that installed but not in operation--may be measured in terms of output by taking into consideration the planned expenditure of norms per unit.

In order to ensure comparability among the individual enterprises in terms of the data of the results of the struggle for fuller participation of the equipment in the process of production, two coefficients may be computed: a) the coefficient of the installed equipment, as a ratio between that installed and that available; and b) the coefficient of the working equipment as a ratio between that utilized and that installed. However, the real reasons which have made the installation of the entire existing equipment impossible, must first be found, as well as why a portion of the installed equipment has not been in operation. Of particular importance in this matter is the operational analysis, which permits the timely revelation of the unfavorable factors and makes it possible to carry out the necessary measures for their elimination.

IV

The second direction in which the analysis of utilization of the productive capacities must be made is with regard to the utilization of the time worked, which is the so-called analysis of intensity of utilization. The degree of this utilization is measured by the output obtained per unit of time.

The most illustrative way to reveal the degree of intensity of utilization of productive capacities in an industrial enterprise is to recompute the produced output in norm-time according to the plan and to compare it with the time actually spent for its production. In this way we obtain the general indicator for the utilization of the productive capacities. This indicator is computed with regard to the plan norms and gives us an idea of the results of the intensity of utilization compared to the planned one. But in speaking of intensity of utilization, the relationship between the produced output per unit of time and the maximum possible output, also per unit of time, is usually known. Therefore, the degree of intensity of utilization is also based on the progressive

norms which are used in computing the productive capacities. Therefore, the indicator of intensity of utilization, thus computed, is usually less than 1.0, as is also the indicator of the extent of utilization. However, the indicator of the actual intensity of utilization with regard to that planned also has meaning and importance in the analysis. It is this indicator in percentual figures which gives an idea of the fulfillment of the work norms.

The intensity of utilization of the productive capacities must be studied in the above manner (using the indicator with regard to planned utilization), for the enterprise in general as well as for each type of machine. In computing the intensity of utilization of the productive capacities of each type of machine, the processing of the individual details of the products must be recomputed for each machine in terms of norm time and compared with the time actually expended.

However, the above comparisons give a most general idea about the results of the work of the enterprise in terms of intensity of utilization of the productive capacities. They cannot show us the real reasons for the different levels of this utilization. Therefore, it is necessary to carry the analysis deeper in order to reveal the use of the time during which the machines have been in operation, or the so-called working time. The basis of study in this case is the structure of the working time, which is known from our economic literature. As is known, the working time is divided into useful time--spent for the production of adequate output; and time [spent] for the production of output which is discarded, for correcting rejects, and as a result of a deviation from the technological process or inadequacy of the machines. This second part of the working time constitutes in its entirety a reserve for the increase of production.

With the above-mentioned division of the time worked by the machines serving as a basis, the analysis must be aimed in precisely those two directions. First, the reasons for the rejects must be studied as well as the deviations from the technological process and the poor state of the machines; and second, how and under what conditions the working time was used for adequate production.

The studies in the first direction must cover the rejected production by types of products, place of occurrence, and reasons and causes for it. The same thing should be done as concerns the additional time spent because of deficiency of

the machines and deviation from the established technology. Such a detailed study of the reasons for these losses of time, as well as the finding of their causes, makes it possible to introduce the most effective means of eliminating them.

The studies in the second direction--how the time was used for acceptable production--must be made first of all by types of machines. The basis of these studies is the division of the time used, which is also known in our economic literature: machine time, during which the machine is engaged in direct production; auxiliary time, time used for inspection work, for placing and removing the processed materials, changing instruments, for idle moves, etc.; and preparatory and finishing time, time used in preparing the machines for operation, as well as for freeing and cleaning them for the following shifts.

As an aid to the studies as well as a guarantee of the possibility of making a comparative study with other enterprises, the structure of the time worked can be elaborated to show the relative shares of the losses from rejects and from deviations from the technology, the relative shares of machine time as well as auxiliary and preparatory and finishing time. The structure of the time worked should be studied by types of machines, and, in order to see the results of the work of the individual production workers, also by machine. Put together, these data give us an idea about the departments and the enterprise as a whole. However, some necessary data are lacking for the preparation of such a structure. In particular, there are not data on the distribution of the useful time. Therefore, in connection with this analysis, it is necessary to make stop-watch observations; these will also be necessary for evaluating the correct norms of labor and will show how the useful time is actually distributed. These observations will also reveal the top achievements. On this basis the method of Engineer Kovalyov may also be applied, which is, among other things, a method by which the utilization of the productive capacities can be improved.

The analysis of the utilization of useful time, and especially of auxiliary time, may draw the attention of the leadership toward new methods of work in order to reduce that time. The study of the preparatory-finishing time may serve as a basis for some changes in the internal organization, in terms of the supply of the individual products.

V. THE UTILIZATION OF THE PRODUCTIVE CAPACITIES OF THE ENTERPRISE AND THE DETERMINATION OF THE DIRECTIONS OF INVESTMENT IN THE EXPANSION OF THE PRODUCTIVE CAPACITIES

In evaluating the utilization of the productive capacities, it is necessary to present the extent and intensity of their utilization in a generalizing indicator. The indicator of integral utilization, used in statistics, may be used to characterize in general terms the utilization of the productive capacities in these two directions. This is obtained as a product of the two indicators--of extent and intensity of utilization. Thus, for example, if a given enterprise has a calculated indicator for extent of utilization equal to 0.59, and for intensity of utilization equal to 0.70, then the generalizing indicator which shows the obtained degree of utilization in both directions will be equal to 0.413 (0.59×0.70). The difference between 1.0 and this indicator is the maximum possible reserve toward the utilization of which the management of the enterprise should concentrate its attention.

This generalizing indicator may also be obtained by comparing the actually obtained output in conditions units with the actual volume of productive capacities (the productive capacities on the basis of the accounting data). Or, if we compare the actually obtained output with the productive capacities according to the accounting data, we obtain directly the reserves in units of conditional products. However, in order to apply this method of computing the generalizing indicator for the utilization of the productive capacities, some additional calculations are necessary. In the first place, the plan volume of the productive capacities should be corrected on the basis of two possible changes: a) on the basis of the deviation between the actual and planned annual average number of the individual types of machines, and b) on the basis of the changes which may occur in the actual structure of production as compared to the planned one. This means that the productive capacities must be calculated by types of machines, for the departments and the enterprise as a whole on the basis of the actual data for the average annual number of machines and the actual structure of production. After these corrections are made, the generalizing indicator will be obtained directly from the ratio between the actually produced output in conditional units and the corrected productive capacities for each type of machine, department, and for the entire enterprise.

It seems at first glance that in computing the generalizing indicator in this manner more computations are necessary than

if it is calculated as a product of those for the extent and intensity of utilization. First, the calculations which must be made in this case are neither complicated nor especially labor-consuming. Second, this method is more convenient when, for one reason or another, the indicators of the extent and intensity of utilization have not been calculated. Moreover, it expresses better the reserves which are hidden in the under-utilization of the productive capacities.

Some authors propose the use of another generalizing indicator which is considerably less exact but can supplement the conclusions derived from the indicators of intensity and extent of utilization of the productive capacities.⁷ We mean the indicator "value of produced output per lev" or per thousand leva of basic means. The use of this indicator is justified also by the fact that in studying the extent and intensity of utilization of the productive capacities, one cannot find in the prepared indicator a reflection of the state of the basic means. The indicator--value of produced output per level of basic means "...supplements and characterizes more closely the utilization of the productive capacities since it reflects not only the quantity but also the quality (author's italics) of the equipment and areas as well as the remaining material conditions."⁸

In order to calculate this indicator as exactly as possible, the following should, in our opinion, be done: first, only the basic means with an industrial-production purpose should be included, at their reproduction value. Second, the actual indicator must be compared with not the planned but the corrected planned one. The latter includes the change in the volume and quality of the basic means as well as the changes in the structure of production, which change is considerable in many cases. However, the evaluation of the degree of utilization of the productive capacities cannot and should not be based on the discussed indicator. It can and should be used only as a supporting indicator.

VI

The discussed analysis should be made annually and eventually bi-annually. However, it is necessary that the operational leadership also make such an analysis for shorter periods of time, since this would permit an evaluation of how correctly the work on the full utilization of available tech-

nology is organized and directed. This operational analysis may be conducted monthly and in some cases also during shorter periods of time--for example, bi-monthly or every ten days. From the viewpoint of technical convenience, which is extremely important for the operational analysis, it is advisable in this case to evaluate the achievement with regard not to the productive capacities but to the planned degree of their utilization. This means that the actual output should be evaluated with regard to the planned one, taking into consideration the changes in the existing equipment as compared to the planned one. These studies may show an overfulfillment, underfulfillment, or hundred percent fulfillment in the planned degree of utilization of the available technology.

The operational analysis must also be conducted in two directions: with regard to the extent and with regard to the intensity of utilization of the equipment. But, as we have already pointed out, the achievement should be evaluated not with regard to the productive capacities but with regard to the planned degree of their utilization. For this purpose comparative studies should be made with regard to the time during which the various types of equipment have been utilized as well as with regard to the output obtained per unit of time. It is advisable to make these studies by types of machines, automatic lines, and aggregates, which is in the spirit of internal economic accounting. The obtained output or the details which have been produced by given types of machines must be included in the norm time. The actually produced output, when this is obtained by individual types of machines--or the actually processed details compared with that planned for the production--or produced in the same amount of time, does not give us the final result of the utilization of the available technology. The volume of the produced output or of the processed details are conditioned by the following three basic factors: a) the average number of machines, b) the extent of utilization--i.e., the time during which they have actually worked, and c) the intensity of utilization--i.e., according to the output produced or the details processed per unit of time. Keeping in mind the impact of these three basic factors, it is necessary to consider this impact separately in making the operational analysis. In evaluating the utilization of the technology, it is natural that the impact of the first factor should not be taken into consideration, whereby the average number of machines is determined as was shown in the preceding exposition. We will show how to determine the impact of the above three factors with general figures.

Using the following symbols:

N_m = average number of machines

M_h = the machine hours worked per machine during the discussed period

P_{rh} = the production per machine-hour or details processed

the impact of each of the factors will be as follows:

a) the impact of the average number of machines:

$$N_{m1} \cdot M_{h0} \cdot P_{rh0} - N_{m0} \cdot M_{h0} \cdot P_{rh0}$$

b) the impact of the machine-hours worked per machine or the extent of utilization:

$$N_{m1} \cdot M_{h1} \cdot P_{rh0} - N_{m1} \cdot M_{h0} \cdot P_{rh0}$$

c) the impact of the production per machine-hour or the intensity of utilization:

$$N_{m1} \cdot M_{h1} \cdot P_{rh1} - N_{m1} \cdot M_{h1} \cdot P_{rh0}$$

Thus, the limited impact of the extent and intensity of actual utilization of the equipment with regard to the planned degree allows the management of the enterprise to take operationally and on time the measures required to eliminate the errors and weaknesses and expand the achieved top performance.

The application of a thorough analysis of the utilization of the productive capacities will contribute greatly to the fuller utilization of the existing technology, which is at present connected with fulfilling the Five-Year Plan ahead of schedule. The elaboration of the discussed indicators on the basis of which the utilization of the productive capacities is to be evaluated will also lead us to improvement in the planning and particularly in the operational planning. An analysis of the details of utilization of the productive capacities will create possibilities for a correct and timely accounting of the results in this direction in terms of sections of the enterprise as well as individual production workers, since in most of the cases it is connected with the

the activity should be more and better organized and utilized and still more intensive and more effective utilization of individual machines. And this is a decisive premise for the further organization and management of the struggle for a fuller utilization of the productive capacities.

However, in order to apply a thorough analysis in the industrial enterprises, some additional data are necessary regarding the time of utilization and the stoppage of the existing technology. And as is stated in Rabotnicheskoe Delo, 25 August 1958, "...in the machine-building and electric power production branches, which are saturated with modern technology, there is no established accounting system and not thorough analysis is made of the data on the utilization of the machines." The accumulation of these data will not add to the existing accounting procedure, nor will it overburden the accounting apparatus. The data which are necessary in this case will be used not only for analyses of the utilization of the capacities but also in connection with the correction organization of work, of the uninterrupted organization of production, etc. And this means that the creation of such an accounting system, which is rather elementary, is at present a must for our industrial enterprises.

Footnotes

¹Davidov, D.: "Methodology for Calculating Productive Capacities in Industry." Planovo Stapanstvo, No 5, Sofia, 1955, page 87.

²Gilels, G.: "On the Utilization of the Productive Capacities of the Industrial Enterprise," Voprosi Ekonomiki, No 8 1955, page 49 [Soviet source].

³Gilels, G.: Op. cit., page 49.

⁴Kamenitser, S., Kontorovich, V., Pishulin, G.: The Economics, Organization, and Planning of Industrial Enterprises. Moscow Gosizpol, 1958, page 290.

⁵Sholomovich, I. A.: Analysis of the Economic Activities of the Industrial Enterprises. Moscow: Gosfinizdat, 1950, page 74.

⁶The "o" designations refer to the plan data; those with "1" to the accounting data. The plan fund, computed on the basis of the accounting data we understand in this case to be the total number of machine-hours of the actual average number of the machines and their planned work-load. This is the so-called "corrected plan fund."

⁷Barngolts, S. B., Sukharev, A. M.: Economic Analysis of the Work of the Industrial Enterprises. Moscow: Gosstatizdat, 1954, page 127 ff; Semin, S.: "Ways to Improve the Utilization of the Productive Capacities of the Industrial Enterprises." Planovo Khozyaystvo, No 3, 1955, pages 58 and 59.

⁸Semin, S.: ibid., page 59.

and the agricultural branches of production, to develop and to maintain a high level of economic effectiveness, and to contribute to socialist development of agriculture and to assist the working people in their economic leap forward.

BULGARIA

The Principles of the Economic Effectiveness of the Branches in TKZS and Their Indices

[This is a translation of an article by Ivan Lutsov in Izvestiya na Visschiya Finansovo-Stopanski Institut Svishtov, Vol XIII, No 3, July-September 1959, Svishtov, pages 329-345; CSO: 3770-N/b]

One of the greatest victories of the working people in our country during the past 15 years of the people's democratic government is the socialist reorganization of agriculture. This difficult task of the transitory period from capitalism to socialism was solved in a relatively short period of time. The victory of the cooperative structure in the villages and the predominance of the socialist production relations in agriculture show a wide range of development of the productive capacities for increasing and cheapening agricultural product, for a fuller supply of industry with raw materials and of the working people with food products. The amalgamation of the TKZS's [Cooperative Labor Farm] started a new stage in the development of the cooperative structure. At present there are 975 cooperative farms in Bulgaria with approximately 4.5 million cooperative members and over 46 million decares of arable land. The average size of a cooperative farm is 46,000 decares. The TKZS's are already huge agricultural enterprises and are managed by trained and experienced economic and Party cadres. Such enterprises are able to uncover and use all reserves, to fulfill the tasks which will be placed before them during the coming years, and to contribute thereby their share in the economic leap forward in the development of the country.

The responsible tasks placed before agriculture require that each TKZS develop branches, corresponding to the given conditions, which have a high economic effectiveness and allow a rational utilization of the land and the other means of production as well as of the natural and labor resources. The question of determining the economic effectiveness of the crops, the branches and the production in agriculture in general, and in the TKZS's in particular, is of great theoretical as well as practical importance.

This article is an attempt to explain the principle of the economic effectiveness of the branches in the TKZS's, their indices, and some of the methodological problems of determining them.

I

The TKZS's are not in the habit of sufficiently accounting for the economic effectiveness of the individual crops and branches, or of the agrotechnical, zootechnical, and organizational undertakings, as well as the capital investments introduced. The effectiveness of production in the TKZS's is usually judged by the increase in the yields of horticulture, in the productivity of livestock raising, as well as in the remuneration of labor, but these indices cannot give us a full and precise evaluation of the economic effectiveness. Such important economic indices as labor productivity, production cost, and profitability of the branches and crops and of production as a whole are still not computed and analyzed in the TKZS's. In many cases this is the cause of serious shortcomings in the leadership of the farms. By not calculating and analyzing the economic effectiveness of the branches, the TKZS managers are deprived of many possibilities of uncovering and utilizing the reserves for increasing and cheapening agricultural production.

The question of determining the economic effectiveness of the branches and production in the TKZS's is still not sufficiently elaborated, and some of these questions are under dispute. Even the concept of economic effectiveness of agricultural production is in many cases given a different meaning. In some cases it means the increase in the yields of the crops and the productivity of the livestock; in others, profitability; in still others, productivity of labor.

In our literature the concept of economic effectiveness is most frequently identified with the concept of profitability. We will mention some definitions of economic effectiveness of the branches in the kolkhozes as given in Soviet literature: "The economic effectiveness of the public households of the kolkhozes and their individual branches can and must be judged first of all by the gross income as a whole;" and further: "The ratio of the net income of the enterprise to the cost of the entire realized production is the indicator of its profitability (economic effectiveness)."¹ Such a

definition of the economic effectiveness of the branches in the kolkhozes is also given by M. Yu. Tsunkov: "The economic effectiveness (profitability) of the branches under the conditions of a specific household is determined... by the volume of the gross income of the kolkhoz, distributed per working day, to each able-bodied kolkhoz member and per ruble of expenditures."² These definitions of economic effectiveness are basically correct but insufficient. The productivity of the branches and crops is one of the important indicators of the effectiveness of production, but it characterizes only one side of the economic effectiveness. In the TKZS's the profitability of the branches may be increased [even] by an absolute reduction in the total production and the yields per unit of area. This can be done by reducing the cost of live and social labor, changing the structure of the fulfillment of production--sale of more products on the cooperative market, etc. In view of the purpose of production under socialism, a branch of the TKZS's which requires a reduction in the yields of agricultural output cannot be considered effective, even if this branch has a high norm of profitability. The increase in profitability of the branches of the TKZS's must go together with an increase in production obtained per unit of area, by an improved utilization of the land, and by increasing its economic fertility. Thus, the profitability cannot by itself characterize the economic effectiveness of the branches in agriculture.

Under capitalism, where profit is the sublime goal and the moving force of production, profitability can be considered as a sufficient indicator of the effectiveness of production. If a given branch meets the average norm of profit, it can be considered effective. Under socialism, production has principally a different aim--the constantly greater satisfaction of the every-growing needs and a many-sided development of all members of society within the framework of the achieved standard of development of the productive forces. This aim is determined by the requirements of the basic economic law of socialism. This also represents the ultimate purpose of production of the TKZS's in all their branches. A determination of the principle of economic effectiveness of production in the TKZS's must be based on the requirements of the economic laws of socialism and at the same time take into consideration the peculiarities of agricultural production.

The same economic laws which are valid for the other branches of the socialist economy are also valid for agriculture. And since this is so, there must also be a general

criterion for determining the effectiveness of production in all branches of the national economy, and the statement that each branch has its own criterion for determining the effectiveness of production is unfounded and unreasonable. The general criterion characterizing the economic effectiveness of production in all branches of the socialist economy, as is shown by the classics of Marxism, is the increase in the productivity of social labor. "The less time is necessary for the society to produce wheat, meat, etc., the more time will be gained for other production--material or spiritual. The many-sided development of consumption and activity of the individual as well as of society depends upon the saving of time. In the final analysis, any kind of saving constitutes a saving in time; thus the saving of time as well as the planned distribution of the working time in the various branches of production remains the first economic law of collective production."³

The main feature of agricultural production is the utilization of the land as a basic means of production. From an economic point of view, the land is the basis for material production. In industry, the land serves as a basis for the buildings, factories, plants, for installing the machines and tools of production. In agriculture, the land is the principle means of production. In this case it plays an active role and cannot be replaced by anything. "It is a supremely important means of production and, excluding man and his labor, it is the only original means of production."⁴

All branches of agriculture are connected with the land, and its development depends to a considerable degree on how correctly and effectively its wealth is utilized. Labor productivity in agriculture is closely connected with the utilization of the land. Live labor and the other means are applied to the land. Irrational utilization of the land may reduce the effectiveness of the other means of production and of labor as well. One of the most important features of the land as a basic means of production is that, when utilized correctly, it does not wear out but on the contrary, it improves. Therefore, correct utilization of the land is one of the basic requirements in the scientific organization of agricultural production. The evaluation of the economic effectiveness of the individual branches of agriculture should not be made without taking into account the degree of utilization of the land and the natural climatic conditions. Consequently, besides the general indicator of economic effectiveness (productivity of labor), special indicators which

characterize the degree of utilization of the land and of the natural conditions are also needed. Such indicators are the yields of the individual crops, the productivity of live-stock, and the agricultural output planned per 1,000 decares of land.

From the basic economic law of socialism, from the law of uninterrupted increase in productivity of labor, and from the entire essence of socialism derives the necessity of obtaining for the given level of development of the productive forces the maximum quantity of agricultural production per unit of area with the minimum expenditure of live labor and means per unit of output. This is also the essence of the economic effectiveness of agricultural production and all its branches. The economic effectiveness of the crops and branches of agriculture consists in the increase in the productivity of social labor, the production of the maximum quantity of agricultural output per unit of area with the minimum use of live labor and material means (materialized labor). Such a definition of the economic effectiveness of the branches of agriculture (considerably broader than profitability) must be expressed in concrete indicators for the complex and varied conditions of agricultural production. As some Soviet economists correctly state,⁵ there cannot be a single indicator which will be itself characterize all aspects of the economic effectiveness of agricultural production. In studying the effectiveness of the agricultural branches, it is necessary to use a system of indicators which in their unity and interconnections would characterize the different aspects of the unified contents of the concept of economic effectiveness. Such indicators are 1) labor productivity; 2) cost of production; 3) amount of the total and net income; 4) agricultural output per 1,000 decares of land, crop yield, livestock productivity. All these indicators reflect different aspects of the economic effectiveness of agricultural production. These indicators were also used by the participants in the All-Union meeting on the questions of determining the economic effectiveness of agricultural production in the USSR (1958). There is a close connection and mutual dependence between the indicators of economic effectiveness. This is shown in Table 1, where the indicators of economic effectiveness with regard to the output of corn in 38 TKZS's of Pleven Okrug in 1957 are computed.

Table 1

Mutual Connection and Mutual Dependence Between the
 Indicators of Economic Effectiveness in the
 Production of Corn in the TKZS's in
 Pleven Okrug during 1957

Indicators	TKZS Groups per Corn Yield per Decare			
	From Up to 150 kilo- grams	From 150 to 200 kilo- grams	From 200 to 250 kilo- grams	Over 250 kilo- grams
	I	II	III	IV
1. TKZS in the group	3	5	13	17
2. Kernel yield per decare, kilograms	132.60	183.50	233.60	282.20
percent	100.00	138.40	176.20	212.80
3. Expenditure of man-days per decare	2.87	2.99	3.11	3.24
percent	100.00	104.20	108.40	112.90
per 100 kilograms of kernel	2.17	1.63	1.42	1.09
percent	100.00	75.10	65.40	50.20
4. Cost per 100 kilograms, leva	78.27	78.18	73.04	66.15
percent	100.00	99.08	93.30	84.50
5. Net income per decare, leva	75.22	104.17	144.74	194.30
percent	100.00	138.50	192.40	258.30
per man-day, in leva	26.20	34.80	46.50	60.00
percent	100.00	132.80	177.50	229.00
per 100 leva of ex- penditure, in leva	72.40	72.60	84.80	104.10
in percent	100.00	100.30	117.20	152.50

The data show that a 112.8-percent increase in the yields per decare increased the expenditure of live labor per decare by 12.9 percent, and decreased it per 100 kilograms of kernel by 49.8 percent. The cost of production thus decreased by 33.85 percent, while the profitability increased by 158.3 percent per decare, 129 percent per man-day, and 52.2 percent per 100 leva of expenditures. In the most general way, the connection and mutual dependence between the indicators of economic effectiveness is expressed by the fact that, with

With the intensification of the new agricultural technique, with the increase in the yields, the expenditure of labor is increased per unit of area and decreased per unit of output. Thereby the lowering the expenditure of labor per unit of output is more rapid than its increase per unit of area, and accordingly the labor productivity grows. The increase in labor productivity leads to a decrease in the cost of production and to an increase in the amount of the total and net income. This principle can be applied in all branches of the TKZS's. There are cases in practice where a certain increase in output is achieved for some crops and in some branches by means of large expenditures of labor and means, whereby the cost of production is increased and the profitability lowered. There are also cases where the expenditure of means and labor is lowered but at the same time the agricultural output per unit of area is also considerably lowered. This shows that the production in such branches and the measures taken are not sufficiently effective. The study of the economic effectiveness in the branches and crops in the TKZS's on the basis of a system of indicators permits a correct evaluation of all aspects of the effectiveness of production, reveals the shortcomings in the work, and makes it possible to uncover and utilize the reserves and the ways of increasing and cheapening the output of agricultural products in the TKZS's.

In evaluating the effectiveness of the TKZS branches, it is necessary to take into consideration several basic situations. First of all, it is necessary to take into account the interests of the individual farm as well as the interests of the socialist state. The TKZS's must produce the agricultural products required to satisfy the needs of the socialist society, for personal consumption, and the needs of industry and foreign trade. Therefore, it is necessary that the TKZS's increase not only the total yield of agriculture products but also commodity portion of the produced output, which is to be consumed by the entire society. A branch whose output is not necessary to the socialist society cannot be economically effective. It is extremely important for our social development to take the interest of the socialist state into account in developing the individual branches of the TKZS. From this does not follow at all that the interests of the individual farms should be neglected and that it is sufficient that the output of a given branch be necessary for the state in order to be effective. In the development of our country there have been cases where the interest of the farm and the principle of material incentive have not been sufficiently taken into account in planning, parcelling, and redistributing the

branches of agriculture, as well as in determining the prices of some agricultural products. The undertakings carried out by the Party during recent years aimed at the improvement of the system of planning; the abolition of the system of compulsory state deliveries; the establishment of unified purchasing prices for agricultural products, whereby the purchasing prices of some products are considerably increased; the introduction of monetary payments for MTS work; the expansion of the right of the TKZS's in selecting specific undertakings, forms of organization and the remuneration of labor, distribution of income, etc.; open new possibilities for a fuller coordination of the interests of the TKZS's with the interests of the state in order to increase the effectiveness of production in all basic branches of the TKZS. Under these conditions, the questions concerning the correct scientific determination of the economic effectiveness of the TKZS branches assumes an important practical significance.

The individual agricultural branches are closely interconnected and the development of one branch often influences the increase in output of another branch. This is an important fact which must be taken into consideration in evaluating the effectiveness of the branches. The low effectiveness of some branches does not necessarily mean that they must be eliminated. It is necessary to determine the reasons for it, the perspectives for the development of this branch, the place that it occupies in the system of the economy, and its significance in the development of the production of other branches.

Under specific natural and economic conditions in the TKZS's it is necessary to develop basic branches whose production as a rule should be highly effective, and also additional branches which may have a lower level of effectiveness but which influence the increase in effectiveness of the output of the TKZS's as a whole. The correct coordination of the basic and additional branches is one of the main conditions for increasing the effectiveness of the TKZS output.

An evaluation of the economic effectiveness of the TKZS branches considering only the present conditions of production without taking into account the possibilities of changes in these conditions, such as an increase in the irrigated areas, an expansion of mechanization, an increase in the production of mineral fertilizers, and other undertakings aimed at increasing the soil fertility as well as the productivity of the livestock, may lead to incorrect conclusions. Thus, for example, the average yield of a milch cow in the

TKZS's increased 2.5 times during the last three years (from 666 liters in 1953 to 1,633 liters in 1958) and continues to increase rapidly. Similar achievements occur in all TKZS branches and, as was shown, the increased yields of the crops and the productivity of livestock leads as a rule to a rise in the level of effectiveness of agricultural output. The undertakings in agriculture during the Third Five-Year Plan will considerably improve the conditions for the development of the individual agricultural branches, and this will lead to an increase in the effectiveness of these branches. It is sufficient to mention that at the end of the Third Five-Year Plan agriculture will receive 30 kilograms of mineral fertilizers per decare as against 4 kilograms during the Second Five-Year Plan. The scientific evaluation and analysis of the economic effectiveness of the TKZS branches require that the present as well as the future conditions for the development of the individual branches be taken into account.

The study of the economic effectiveness of the TKZS branches should be made on the basis of data covering many years. A peculiarity of the agricultural branches is that the process of reproduction is connected and interwoven with the biological processes of growth and the development of organisms, both plant and animal. The human influences on these processes is still limited, regardless of the tremendous achievements of science, and the natural factors play a considerable role, especially in plant raising. The agricultural output under out conditions is still fluctuating-- the yields increase in favorable years and fall in unfavorable ones. In order to eliminate the influence of accidental factors and fluctuations in the yields according to the climatic conditions, it is correct to study the effectiveness of the branches on the basis of statistical data covering three to five and even more years, depending on the goal which the study is to achieve.

II

The productivity of labor is the most important indicator characterizing the economic effectiveness of production. An increase in labor productivity increases the agricultural output and lowers the cost per unit of output; the total and net income increase, the remuneration of the cooperative members increases, and the means for accumulation and expansion of production grow.

Labor productivity in agriculture, as in all other branches of production, means the ability of labor to create a given amount of consumer value per unit of working time. The essence of the process of increasing labor productivity consists in time-saving and is determined by the amount of output (consumer value) produced per unit of working time, or by the amount of working time required for the production of a unit of output. Therefore, in order to compute the labor productivity one must know the quantity of produced output and the working time expended for it.

In TKZS practice, the actual level of labor productivity is not calculated and analyzed. Most often labor productivity in the TKZS is judged on the basis of indirect indicators. The question of taking into account the working time has not been solved by the TKZS. The expenditure of labor is accounted for in labor-days. In practice, some managers as well as some economists use the working day as an indicator of labor productivity in the TKZS. The working day, as a measure of labor and distribution, allows a comparison of the heterogeneous labor of the cooperative members, and as such has played and still plays an important role in the development and consolidation of the TKZS. But the working day cannot show the actual level of labor productivity in the TKZS. It is not a measure of the working time spent. One working day contains in each concrete case a different quantity of working time. Sometimes working days are credited for different services. In some TKZS land contributed is credited in terms of working days. In the case of overfulfillment of the daily labor norms, the quantity of the credited working days is accordingly increased, although the working time does not change, and even increased per unit of output, so that the labor productivity increases too. The crediting of working days is not proportional to the working time spent and the utilization of the working day as an indicator of labor productivity cannot take into account the influence of mechanization and of the qualifications of the cooperative members upon labor productivity. The ratio between the working day and the working time actually spent (in man-days and man-hours) differs for individual farms, different branches and crops, and changes year after year. In some cases the working day as an indicator of labor productivity may show a higher productivity in a farm or branch when in reality it is lower, and vice versa. Such is the case shown in Table 2.

Table 2

Working Days and Man-Days Spent for the Production
of 100 Kilograms of Output in Belene, Dekov
and Tatare TKZS's, Pleven Okrug, 1957*

A = Working days; B = man-days

Products	Belene TKZS		Dekov TKZS		Tatare TKZS	
	A	B	A	B	A	B
1. Grains	2.57	1.77	2.57	1.39	2.18	1.84
Wheat	2.47	1.59	2.36	1.22	2.04	1.68
Corn	2.23	1.77	2.25	1.41	1.95	1.73
2. Industrial	4.16	2.72	2.87	2.05	2.93	2.16
Sunflower	17.50	33.93	16.29	21.75	21.43	16.01
Cotton	0.69	0.44	0.68	0.53	0.63	0.56
3. Vegetables						
Tomatoes	2.37	1.84	2.00	1.11	2.38	1.80
Pepper	3.13	2.23	2.91	2.91	2.50	2.29

*Includes the labor of the mechanization workers of the MTS.

The table calculates the labor productivity in some branches and crops in the Belene, Dekov, and Tatare TKZS's of the Dekov MTS region, Pleve Okrug.

If labor productivity is evaluated on the basis of working days spent per unit of output, then it is highest in the Tatare TKZS, but if the real level of labor productivity is computed, then it is highest in the Dekov TKZS and lowest in the Tatare TKZS. Therefore, the working day cannot show exactly the level of labor productivity and should not be recommended or used as such an indicator. The TKZS's should keep a daily accounting of the working time in man-days, and in some branches, such as vegetables, and in some leading farms, in hours as well. Since the amalgamation of the farms they have at their disposal a larger number of specialists, the accounting cadres have improved, and the brigadiers have greater experience, so that such a task can be solved. It is known that even in the agriculture of the capitalist countries the working time is given in hours. The manner in which the man-days are determined in the TKZS's at the end of the year and entered in the annual reports according to branches and crops is not sufficiently exact and does not correspond to the requirements in this regard.

The TKZS production is a result of the joint labor of the cooperative members and the mechanization workers of the MTS. It is necessary to include, besides the labor of the cooperative members which is directly spent for the production of agricultural output, also the labor of the MTS mechanization workers, as well as the general economic and general branch expenditures of labor. It is useful to distribute the indirect labor expenditures in proportion to the direct ones.

Some branches of agriculture give several types of production. In order to calculate the labor productivity in these branches the heterogeneous production must be recalculated in terms of a unit of measure. As concerns the unit of measure, there are different opinions. Some economists suggest that the heterogeneous agricultural production be expressed in terms of grain according to the calories it contains, in terms of fodder units, or labor expenditure. Others suggest the value method--i.e., the monetary evaluation of heterogeneous production. Only foodstuffs can be expressed in calories. But agriculture also produces products which cannot be measured in calories--cotton, hemp, hides, etc. In using the coefficients for labor expenditures, the degree of mechanization is of great importance. The production of branches where mechanization is at a low level and live labor plays a great role (vegetable production, livestock raising, and others) will be evaluated in more grain units compared to the production of branches with a high mechanization. Furthermore, a different volume of live labor is expended for one and the same type of output in different farms and in different years. Consequently, it should be assumed that in preserving the commodity production and the law of value, the most correct way under socialism is to use the value method.

The produced output is a result of the use of live labor, as well as of materialized labor. The classics of Marxism say that the increase in labor productivity includes savings in live as well as in materialized labor. "The increase in labor productivity," writes Marx, "consists precisely in that the portion of live labor decreases while the portion of past labor increases, but it increases in such a way that the total amount of labor contained in the goods decreases; thus the quantity of live labor decreases more than the quantity of past labor increases."⁶ It follows from this statement by Marx that there is an increase in labor productivity only where the saving of live labor is more than the additional expenditures for materialized labor. Therefore, the decrease in live labor per unit of output does not always exactly

and not materialized labor, and also not considering the difference in the cost of materialized labor and the cost of live labor, does not reflect the actual increase in labor productivity. In some cases there may be a lowering of the productivity of labor if expenditures for social labor increase faster than the savings in live labor. Therefore, a calculation of labor productivity on the basis of the savings in live labor alone, without considering the materialized labor, can lead us to incorrect evaluations and conclusions. Materialized labor cannot be accounted for in working time (man-days and hours). Under the conditions of commodity production and the law of value, the past (materialized) labor can be accounted for only in a value form, in terms of the cost and value of the output. Therefore, labor productivity in the TKZS must be complemented by a calculation and analysis of the level and structure of the cost of the production. The simultaneous analysis of the productivity of live labor and the production cost compensates for the inability to account for materialized labor in terms of working time. Marx draws attention to the fact that a decrease in the cost of production is identical with an increase in labor productivity. "The real saving consists of the saving in working time and reducing to a minimum the costs of production; this saving is identical with the development of the productive forces."⁷

Under the system of indices characterizing the economic effectiveness of production in the TKZS, the productivity of labor should be calculated:

- a) by branches and crops--the use of labor in man-days (hours) for the production of a unit of output in kind. The reverse relationship has the same meaning--output produced per unit of working time;
- b) in the farm as a whole--the use of man-days (hours) for the production, for example, of 100 leva of agricultural output or produced output in value terms per unit of working time.

III

The cost of production reveals the most aspect of the economic effectiveness of production. The cost reflects the level of the organization of production, the savings in material means and live labor. The cost is an elementary condition for applying economic accounting as a method of planned management, of correct determination of the profitability by crops and branches. By analyzing the structure of the production cost, and its individual elements, ways are found for reducing it, which is identical with an increase in labor

productivity. In practice, the cost of production in the TKZS is not calculated and the method recommended by the MZ [Machine Plant] is used only by some individual farms. In connection with the calculation of the production cost in the TKZS there are two questions which are particularly controversial: the question about the ratio of labor remuneration of the cooperative members and the cost of production, as well as the question of the monetary evaluation of the products which constitute production.

During the discussion concerning the question of including expenditures for the labor of the cooperative members (kolkhoze members in the Soviet Union) in the cost of production different opinions were expressed in our country and in the Soviet Union to include in the cost the actual remuneration of the working day; the labor of the cooperative members to be re-evaluated on the basis of the paid labor of the workers in the DZS's [State Farms] and others. In order to determine the economic effectiveness of the branches in the individual farm, to meet the needs of economic accounting and the internal economic analysis in the TKZS's, the cost of production should be calculated according to the actual remuneration of the labor of the cooperative members. The plan and the economic accounting are concrete methods of management which do not tolerate "ifs" and cannot be built upon conditional expenditures for labor remuneration. The cost of production in the TKZS's, calculated on the basis of the actual remuneration of labor, is not completely in unison with the economic content of the cost of production category, inasmuch as the income distributed per working day sometimes includes not only the value of the necessary product but also part of the net income obtained and differential rent. But such an item in the costs of production in the TKZS does exist in reality and the farms cannot disregard its calculation and analysis. The contradiction between the economic category of cost of production and the cost of the production in the TKZS's cannot be eliminated by a mechanical transfer of the working wage from the DZS's to the TKZS's. A method must be found for computing the cost of the necessary product separate from the net income obtained by the cooperative members for the TKZS. This problem can be solved by a further improvement in the organization and remuneration of labor in the cooperative farms. The existing form of distributing the income in the TKZS's by working days, which form arose under specific conditions, is not the only possible and obligatory form of labor remuneration in the enterprises built on the basis of the cooperative form of socialist property. In the TPK [Labor

Producer Cooperatives], which are also cooperative enterprises, the cooperative members receive separately the value of the necessary product, and at the end of the year receive part of the net income realized by the enterprise, under the form of additional remuneration. Many kolkhozes in the Soviet Union and some cooperative farms in our country are introducing a fixed remuneration of labor, without the intervention of the working day. At present there are conditions in our country for using in the TKZS the monetary labor remuneration of the cooperative members and the accumulation of the necessary reserves for securing a guaranteed remuneration. By determining a fixed remuneration in the TKZS's, the cost of production will include this remuneration, and separately from it the cooperative members will receive part of the net income realized by the farms. The guaranteed remuneration of the labor of cooperative members will be different at the beginning for the individual farms. But gradually, on the basis of the general progress in the TKZS through expansion of the production basis, increase in the production and the productivity of labor, reduction of costs, improvement in methods for determining and distributing the differential rent among the TKZS and the state, etc., the economic differences between the individual farms will decrease, the differences in the guaranteed labor remuneration will be reduced to a minimum, while the differences in the level of development of the individual farms will be expressed in the amount of the realized net income.

One of the main arguments against the inclusion of the actual remuneration of the labor of the cooperative members in the cost of production in the TKZS's is that in the leading farms the remuneration per working day is higher, and the cost of production will be higher than that in the weaker farms where the remuneration for the working day is lower, and that the increased remuneration of labor in the TKZS's will lead to an increase in the cost of production. Usually single data for one or two farms are given in support of this opinion. The steady decrease in the costs of labor per unit of production on the basis of the uninterrupted increase in labor productivity must precede the increase in the worker's wages. This principle is characteristic also of the TKZS's as socialist enterprises. In the TKZS's the decisive factor for the remuneration of the working day is also the achieved level of labor remuneration. The socialist state, through the system of prices, the tax policy, and other undertakings, regulates the influence of the differential rent, the conditions of the realization of production, and other factors influencing the remuneration of labor of the cooperative members.

Thus, the remuneration per working day is high in farms where the productivity of labor is higher and the cost of the production of the basic branches is lower, regardless of the high remuneration for the working day. In analyzing mass data, this principle will always come through. In order to obtain mass data confirming this principle in the TKZS's, we calculated the cost of the production in 33 TKZS's in Pleven Okrug in 1957. Because of limited space we publish in Table 3 only part of these data concerning the cost of production of sugar beets.

Table 3
Mutual Connection Between Yields, Actual Remuneration of Labor, and Cost of Production in the TKZS's in the Production of Sugar Beets During 1957

TKZS Groups	Number of TKZS in the	Average Yield per Decare	Actual Remuneration per Working Day, in leva	Cost of Production per ton of Sugar Beet, in leva
Group I up to 2.5 tons per decare	9	1,677	18.16	274.80
Group II 2.5 to 3.5 tons	13	2,851	20.72	205.60
Group III over 3.5 tons per decare	11	5,135	21.13	186.70

The farms are grouped in the table by the average yields of sugar beet per decare. In the first group, the yields and the remuneration of the working day are the lowest, while the cost per ton of sugar beet is the highest; in the third group, the beet yields and the remuneration of the working day are the highest, while the cost is the lowest. There are some single exceptions within the individual groups, where the high remuneration of labor is accompanied by a high cost of production, but this cannot be explained by the remuneration of labor alone. Many other factors influence the level of the cost as well. Furthermore, there are cases where the labor remuneration precedes the increase in labor productivity. But such exceptions occur in other branches as well as in the state enterprises and they do not invalidate the action of the general principle. No law, no principle appears in its pure form, but is interwoven with many accidentals and has to

... no direct method of influence and [therefore] difficult to cope with them. The establishment of uniform purchasing prices for agricultural products limits the possibility of increasing the remuneration of the working day at the expense of [making] more favorable conditions for realization, and there is no reason for excluding the actual labor remuneration of the cooperative members from the cost of production in the TKZS's.

The products and materials of household production which are used within the TKZS's occupy an important place in the cost of production. With the establishment of uniform state purchasing prices for these products, it is advisable to include them in the cost of production at these prices. Such an evaluation of the products of household production, used within the farms, corresponds to the requirements of the law of value, [according] to the statements of Marxist classists. In criticizing Robertus, Marx writes: "The concept 'expenditures' does not require, as Robertus thinks, that the product in its quality as a commodity be purchased by others. If one or another portion of the product, instead of being sold as a commodity, re-enters production, then it enters into it as a commodity."⁸ The products and materials of household production are easily included in the cost of production at uniform prices and permits a determination of the profitability of the farm by crops and branches. For example, the cost of production in livestock-raising, computed on the basis of the fodder evaluation at uniform prices, will reflect the production costs in livestock-raising. The profitability in livestock-raising, computed on the basis of this cost, will reflect the income created by the cooperative livestock raisers.

IV

The profitability of the branches is an important indicator of the effectiveness of production. In order to determine the profitability, it is necessary to compute the total and the net income. In the TKZS' practice the total and net income per branch is not computed. In the accounting system and economic work of the TKZS's, the concepts of "natural incomes" [incomes in kind] and "monetary incomes" have gained wide use; the first term is usually understood to mean the entire output in kind; the second term expresses all monetary revenues. Such a practice does not correspond to the Marxist theory of expanded reproduction. It is known that not all the produced output and monetary revenues constitute income. The

total production contains the value of the means spent on production, transferred to the new product, which is not and should not be called income. The value of the means used for production, which will be used for reproducing these means should be excluded from the value of total output and only the remaining part constitutes total income. The total income is the value of the product newly created by the labor of the cooperative members. It is a source for accumulation and for personal income of the cooperative members. Under the conditions of the TKZS's the total income reflects relatively most fully the profitability of the branches and crops. The relationship of the total income to the materials expenses characterizes the level of the profitability of the respective branch; its relationship to a unit of area gives an idea of the land utilization; its relationship to the working time characterizes the productivity of labor. By comparing the profitability of the branches an extremely varied picture is obtained. Some branches have a high profitability compared to costs and a low one in terms of man-days, and vice versa. Thus, for example, the profitability of the vegetable crops in the TKZS of Chervena Village is 430 percent (ratio of the total income to the costs), while that of the grain crops is 180 percent--almost two and half times lower, but per man-day used in the vegetable production, the total income is 34 leva, while per man-day used in the grain crops it is 69 leva--i.e., twice as much. This is explained by the unequal degree of mechanization of the individual branches. The vegetable crops are poorly mechanized and very labor-consuming, while the grain crops are highly mechanized. Therefore, in evaluating the profitability of the branches only by the volume of the total income, the labor intensity in the crops and branches is not taken into consideration, nor is the influence of mechanization; thus this indicator cannot be made comparable.

It is necessary that the TKZS's also calculate the net income obtained by the farm. The net income is obtained by subtracting from the total income the actual remuneration of labor (or by subtracting from the value of the total output the full production costs). In the enterprises where workers' salaries are paid, the ratio of the net income to the cost of production represents the norm of profitability. Some authors consider the norm of profitability in the TKZS's as the only indicator of economic effectiveness. In the TKZS's the norm of profitability cannot characterize by itself the profitability of the branches. The existing system of income distribution in the TKZS presumes that part of the total income will be set aside for replenishing the social funds, regardless of

the level of labor remuneration and that the remaining part will be distributed by working days. In this manner the social funds of some TKZS's include part of the necessary product of the cooperative members, and in some other farms the remuneration per working day includes part of the net income. As long as the TKZS's do not have a guaranteed remuneration and do not differentiate between the value of the necessary product and the net income which is obtained by the cooperative members, the boundary between the total and the net income cannot be exactly drawn. The net income will have a certain conditional significance and does not reflect all of the net income realized in the farm. But the calculation of the net income by branches and crops in the TKZS's is necessary and it considerably clarifies the picture of the profitability. Under the norm of accumulation established for the individual farms, the calculated net income per branch shows which branch and to what degree it participates in the expansion of production and which branches do not cover the expenses of production at all. At the present stage of development of the TKZS's the profitability per crop and branch should be studied and characterized simultaneously by the volume of the total and the net income. The main difficulty in calculating the total and net income represented the evaluation of production. With the introduction of the uniform prices and the changes which were made in the accounting system of the TKZS, these difficulties are eliminated.

V

The development of the branches in the TKZS depends directly upon the quantity and quality of the land of the farms and the degree of its utilization. The indicator which characterizes this aspect of the economic effectiveness of agricultural production is the agricultural output obtained per 1,000 decares of land. The crop yields and the productivity of the livestock are not entirely sufficient as indicators of the utilization of the land. The TKZS's may receive high yields from individual crops and may have a high productivity, and yet, because of under-utilization of the land, incorrect coordination of the basic and additional branches, an insufficient amount of productive livestock, and other reasons they may receive a small quantity of agricultural output compared to the possibilities and the land at their disposal. Some economists and experienced workers overestimate the significance of this indicator by using it as the sole criterion for evaluating the effectiveness of agro-

technical and zootechnical undertakings. With the help of this indicator some undertakings are often justified which give a certain increase in production by greatly increasing the expenditure of live labor and material means, leading to a lower productivity of labor and to an increase in the cost of production. In evaluating the economic effectiveness of the crops and branches or of the applied undertakings, the indicator of agricultural production obtained per 1,000 decares must be viewed in connection with the other indicators which characterize the economic effectiveness of production. This indicator must be calculated in natural and in value form. The use of constant prices enables us to follow the physical volume of the agricultural production and the increased utilization of the land in a dynamic manner.

Different kinds of agricultural products are sometimes computed on the basis of individual types of cultivated land. Some products (milk, meat, and others) are calculated on the basis of total areas; other products (pork) only on the basis of plowed fields; still others (eggs, poultry) on the basis of the areas of grain crops. Such a practice is usually explained by such arguments as that some branches of agriculture develop on the basis of one type of crop while others develop on the basis of other crop areas. Such an explanation is not entirely correct, and the calculation of agricultural production on a different basis permits the concealment of shortcomings in the utilization of land. The TKZS branches develop in close connection with each other, and it is not correct to argue that some branches of livestock-raising develop on the basis of only type of crop land independently of other branches. Thus, for example, the poultry output is compared only to the areas of grain crops. But for the development of poultry-raising not only grain is necessary but also a modern material-technical base. Many cooperatives farms build large mechanized poultry centers. The means required for this construction come not only from the grain crops but also from the areas sown in industrial crops, perennials, etc. which bring the farm a higher net income. The same is also true of hog-raising, whose production is compared only to the plowed field areas. It is necessary to organize in the TKZS a rational utilization of all the land, including meadows and pastures obtained without remuneration from the state in 1958. It is necessary to use a unified indicator of land utilization--the agricultural output obtained per 1,000 decares of cultivated land.

* * *

The fulfillment of the responsible tasks which are placed before agriculture in connection with the economic leap forward in the country's development requires a thorough evaluation of the economic effectiveness of the output of the TKZS's and their individual branches of the undertakings applied to production. It is necessary to plan and account for the indicators of economic effectiveness in the TKZS. This will contribute to a fuller utilization of the value categories in the management of the farm, and to the introduction of economic accounting as a method of planned management; increase the material interest in the TKZS; lead to uncovering reserves for a fuller utilization of the land, the remaining means of production, and the labor resources; to a more correct coordination of the branches and the introduction of economically effective undertakings in production, and to the production of greater and cheaper agricultural output for the needs of the working people.

Footnotes

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POLAND

Concerning the Meat Situation in Poland

[This is a translation of an unsigned article in *Przemyslu Spozywczego*, No 11-12, November-December 1959, Warsaw, pages 483-487; CSO: 3782-N/1]

In connection with the difficulties on the meat market, the Minister of Domestic Trade (Minister Handlu Wewnetrznego) introduced one meatless day per week. On this day restaurants will serve meatless dishes and meat stores will limit their supplies to liver, bacon, and similar products.

The problem was thoroughly discussed by the daily press. On our part, we wish to attract attention to certain economic proportions of this problem, to the tasks which for this reason arise for the food industry and out Society [not identified], and the factors concerning this problem with the general food problems in Poland.

Two problems are usually dealt with: level of consumption and level of breeding. In 1948 [sic; presumably 1958] meat consumption was estimated at 48.1 kilograms per year per person (including pork fat, excluding horse meat, poultry, and game; meat consumption excluding pork fat was 40.0 kilograms). In comparison with the consumption in other countries, this is not high, for it exceeds only the consumption of Holland, Greece, Hungary, and Italy (from among the Western European countries). On the other hand, it is lower than the average annual consumption of the inhabitants of many industrial countries. The percentage of increase in meat consumption in recent years is interesting. Thus, for example, when in 1929-1939 an increase in consumption from 18.4 kilograms to 22.4 kilograms took place—that is, by about 2 percent per year, in 1949-1958 the increase in consumption from 28.7 kilograms reached 48.1 kilograms, which corresponds to an increase of about 7 percent year (or, after conversion into meat excluding pork fat, poultry, horse meat, and game, from 24.4 kilograms to 40 kilograms).

Comparing the last prewar years with the years of 1955-1958, the increase in meat consumption, including pork fat, reached about 130 percent, and on this scale it sharply ex-

ceeds that of the richest industrial countries. The corresponding increase in consumption of other products is much smaller. It could be said that we spend too much on meat and not enough on food of plant origin.

This increase in consumption was a result of the level of breeding, of which the development recently encountered certain difficulties. Among the main difficulties, we should classify the absence of proper quantities of fodder. We would like to attract special attention to the help which the food industry can give in this field. This is not a new matter. Let us recall the Resolution of the Council of Ministers (Rada Ministrow) of December 1951 concerning the ensurance of proper resources for the increase in farm animal breeding and development of fodder. Let us recall the wide-scale program of our Society under the slogan "the largest quantity of waste of the food industry for fodder." In fact, the food industry has much to say, having at its disposal several by-products suitable for industrial production of fodder, fodder concentrates, and mixtures. It is regrettable that not all work is collected, properly stored, and directed to plants producing concentrated fodder. We were told that one of the factors adversely influencing the waste management is the current system of prices for waste.

But not only fodder difficulties are of importance here. Let us not forget about the skills of feeding slaughter animals. Of great importance for the effectiveness of fodders is the variety and type of animals, to which not enough attention is devoted in Poland. In Holland, West Germany, and other western countries, from the same fodder unit a much greater increase in meat is attained than in Poland. It is also necessary to improve the method of storing fodder and packaging concentrated fodder, and also to deal in more detail with stabilizers of the value of fodder.

The need to rapidly increase the fodder stocks led to the resolution on the limitation of production of spirits from potatoes. We realize the urgent but rather temporary necessity for such decisions. It seems, however, that a long-range policy should rather, in a stronger way than before, aim at increasing potato crops, which are very low in Poland. We also had a low index of increase in potato crops in 1934-1938 to 1957-1958. Even a modest increase in potato crops will assure us of both fodder and the production of spirits, which latter consumes only 2 percent of the potatoes produced; the production of spirits means production of distillery pulp.

and the existence of small local plants of the agricultural and food industry with considerable social and economic significance to the rural areas.

In addition to the above, it is necessary to consider from the engineering point of view to what extent, under our conditions, the production of spirits should be based on potatoes and molasses. Fully appreciating the importance of the agricultural industry, it is necessary to consider whether agricultural distilleries could not be utilized in a different way (fodder yeast, fruit grinding, potato drying, etc.). It is necessary to consider whether the pulp position is really irreplaceable. It is necessary to consider the possibilities for a much increased melassing of fodders, and to what extent, under our conditions, we can use synthesis of alcohol as a basis.

Efforts to increase potato crops must be accompanied by improvement in potato storage. We cannot understand the neglect of the principle that potatoes should be stored in a dry place and properly sorted, not only according to size but also according to types. It is also necessary to take an interest in substances that arrest biochemical processes and to develop potato flake and drying plants. Primitive, improper storage causes potato losses reaching 15 percent and more. Thus, it seems that the main assumptions of long-term policy ensuring fodder should go in this direction and that it should be understood that fodder for animals does not consist solely of potatoes.

The difficulties of the meat market should be seen not only in terms of the fodder background; there are other important matters too.

As we know, the supply of slaughter animals is not uniform throughout the year. Around July and August we have the so-called "harvest" drop in supply. How can this be overcome? By good management of meat reserves in cold storage. But it is also necessary to give a still greater attention than before to the industrial feeding of pigs, and not only pigs but also cattle. This branch of meat economy, subordinate to the Center of Meat Industry (Centrala Przemyslu Miesnego), supplies about 40,000 tons of meat annually. It would be necessary to make energetic efforts to increase this breeding. At the same time, it is necessary to influence decisively tendencies to avoid that production. It is also necessary to become interested in cattle fattening, particularly on farms possessing distilleries (pulp).

In connection with the difficulties on the meat market, other problems are also of importance to food experts. It must be stated that the increase in consumption of meat products is of rather one-sided nature, because during that time a correspondingly high increase in the consumption of other protein-fat foods, such as milk, fish, or leguminous seeds and vegetables, did not take place. Dietetic experts maintain that in Poland the ratio of animal protein to plant protein is improper and excessive in the case of meat. Although in Poland nourishment from the caloric point of view is sufficient (amounting to approximately as much as in other countries with similar climatic conditions and economic character), its quality and the set-up of caloric groups is unsatisfactory. We do not get enough dairy products, fish, vegetables, leguminous seeds, and fruit.

Much has been achieved in the 15 years of People's Poland: new industrial plants, new directions of production, urbanization, and colossal technical progress. Only nutrition, habits, and tastes remain the same as 100 and 200 years ago. Habits play an excessive part in formation of consumption in Poland, but this is because they are not being combatted by a proper propaganda on current nutrition principles.

Certain corrections are necessary in our nutrition. But who is to deal with this, who is to propagate, who is to prove the correctness of the new assumptions? A sufficiently favorable atmosphere for this kind of work is often lacking. The science of nutrition does not display much activity (a proof of this is that the Chair of Technology and Hygiene of Nutrition [Katedra Technologii i Higieny Zywienia], liquidated in 1950, is reviving its activities at the SGGW [Szkola Glowna Gospodarstwa Wiejskiego; Main School of Rural Economy] only this year). It is also necessary to consider whether Poland should not create a nutrition institute on the pattern of the institutions existing in 70 countries. It seems that the State Hygiene Center (Panstwowy Zaklaz Hygienny), the Committee for Household Management (Komitet Gospodarstwa Domowego), the Institute of Mother and Child (Instytut Marki i Dziecka), the Department of Nutrition (Departament Zywienia) at the Ministry of Domestic Trade, and several other institutions, not excluding our Society, should start working on new varieties of foods and on teaching, instructing, and publishing correct nutrition norms.

Propaganda on correct nutrition--and we have a right to expect this from a socialist state conducting a planned economy--must be accompanied by proper economic policy. It

seems that everything has not yet been done in this field (we will quote some examples recently given by the daily press). It must be said that almost everything has conspired to pave the way for meat and meat products. Meat is among the comparatively more expensive products, and therefore in all cases where the premium is calculated on the volume of turnover (eating places, trade, collective nutrition) meat receives preference and finds willing propagators. For example, much has been written in Poland about excessive sausage consumption, and this is also a result of, among other things, the system of premiums in trade and meat industry, based on value.

It seems at the same time that it would be necessary to analyze the system of prices for foodstuffs, meat, and meat products and to use a price policy giving preference to more valuable and still unpopular foodstuffs.

Meat is a product of uncomplicated and rapid processing in a household and at the same time a highly caloric product, and if meatless days are introduced, it must be replaced by a product with similar properties and values. At this point it would be necessary to state that food enterprises, either key or small, are not prepared for this change. The problem is not new and has been dealt with many times. The production of preserved vegetables and especially vegetable-meat is so small that it could be considered as nonexistent. In this field the consumer uses almost solely imported products. Beans, peas, barley, and rice are not utilized as basic additions to preserved meat. Sometimes one gets the impression that we are still not conducting an investment policy from the point of view of a far-sighted nutrition policy. More inventiveness must also be displayed by dairy, fish, and poultry industries, launching on the market new varieties and new quantities of production.

It is necessary to reach for the still not fully utilized agricultural raw materials. Fish catches, and milk, egg, and fruit purchases must be increased. More attention should be directed to industrial poultry and fish breeding.

The agricultural and food industry still has many difficulties to overcome. The necessary investments should be covered to a greater extent by domestic production of suitable machines and installations. New ships must be built for fishing as well as new cold storage places and cooling installations in food industry plants and new milk collection centers. Refrigerated transportation and other installations resulting

in increased purchases and better protection of foodstuffs must be developed. We still lose too much food on the way from the producer to the consumer.

At this point we cannot ignore the problem of packaging, for we know that it is often decisive. An interdepartmental commission on the problems of packing was once created, but no results of its work are evident.

Eating places have the most to say but so far have displayed no inventiveness as concerns meatless dishes (again premium on value). Meatless dishes or dishes with small quantities of meat are still offered too seldom.

The nearly 10,000 eating places serving over 3 million persons a day cannot remain indifferent to the big program of correction of our nutrition; on the contrary, they must play a basic part in it, and there is still no evidence of their doing so.

On the basis of the above remarks, the tasks for the near future for our Society would be as follows: 1) much more attention should be devoted to the management of waste products in food industry plants; and 100 percent of the protein waste should be utilized for fodder; 2) a technical and economic analysis should be made of the possibilities of expanding the production of alcohol for technical purposes in Poland by means of synthesis; 3) it is necessary to start a big propaganda program for correct nutrition principles, in accordance with modern requirements of physiology; 4) it is necessary to start a drive for the development of secondary occupational schools in the field of nutrition and to organize proper courses by our societies; 5) it is necessary to examine the possibilities of stronger organizational ties between engineers and technicians working on nutrition problems.

In cooperation with the Society of Agricultural Engineers and Technicians (Stowarzyszenie Inżynierow i Technikow Rolnictwa), it will be necessary to expand the program of propaganda and instruction on proper storing and utilization of fodders, and the Society of Agricultural Engineers and Technicians should contribute to a development of leguminous cultivations rich in protein and the acclimatization of proper varieties of soya. Much greater attention should also be directed to poultry.

It is necessary to aim at making our nutrition [program] take into account in a more uniform way economic factors, eating habits, productive possibilities, and the principles of physiology.

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POLAND

Effectiveness of Investments in the State Food Industry

[This is a translation of an article by Edward Rybarczyk of Warsaw in *Przemysl Spozywczy*, No 11-12, November-December 1959, Warsaw, pages 488-498, (Part I of this article appeared in No 10 of the same publication); CSO: 3782-N/2]

This continuation of an article on capital absorption of production in the food industry constitutes a contribution to the discussion on the problems of economic effectiveness of investments in the food industry--Editors.

The analysis of the index of capital absorption expressing the ratio of the volume of fixed capital to the volume of production indicates a clear tendency to drop in the 1950-1960 period. A drop in this index in 1961-1965 is also indicated. Taking into account the considerable drop in the volume of investments in the next Five-Year Plan (maintaining the original production assumptions) in comparison with the previous program, which constitutes a basis for the calculations contained in this article, it must be stated that the drop in the index of capital absorption in production in 1961-1965 will in reality be larger than follows from the data in the table.

Although in the food industry as a whole the index of capital absorption has been showing a further tendency to drop, in individual branches diverse directions occur. In principle, the industry can be divided into three groups. The first group embraces the branches in which a drop in capital absorption occurs. They are the sugar, oil, beer, fruit and vegetable, food concentrates, and refrigeration industries. The second group embraces the branches in which the index of capital absorption becomes stable. The meat, herbs, and partly the candy industries belong to it. The third group embraces the branches in which the index of capital absorption increases. The group embraces the egg and poultry, tobacco, and potato industries.

Table 1
Index of Capital Absorption of Production in 1950-1965 (Ratio of Fixed Capital to Value of Production) in Złotys

	1950	1955	1960	1965	Indices of Increase (1950 = 100)	1960	1965
Total food industry	0.69	0.50	0.44	0.42	64	61	
Sugar industry	1.77	1.72	1.64	1.58	97	89	
Fat industry	0.09	0.10	0.09	0.07	100	78	
Beer industry	2.34	1.58	1.47	1.42	63	60	
Fruit and vegetable industry	1.18	0.59	0.48	0.44	41	37	
Tobacco industry	0.33	0.31	0.32	0.35	97	106	
Candy industry	0.60	0.39	0.29	0.29	48	48	
Food concentrates industry	0.47	0.39	0.37	0.31	79	66	
Meat industry	0.16	0.16	0.14	0.15	88	94	
Milling industry	1.00	0.59	0.56	0.59	56	59	
Egg and poultry industry	0.03	0.08	0.11	0.12	367	404	

In the first group, the oil and beer industries are of interest. Typical of the oil industry is the fact that out of 14 branches of industry it shows the highest rate of increase in labor productivity with the highest increase in effectiveness of fixed capital, in which the effectiveness of investments is also shown.

The position of these three curves in Figure 5 confirms the exceptionally well prepared investment program ensuring the maximum effectiveness of outlays and high labor productivity. This is one of the most difficult problems of programming. The essence of the high effectiveness of investments in that industry lies mostly in the intensification of the apparatuses of continuous extractions, not involving replacement of basic installations but consisting in supplementing the existing installations with additional equipment.

The preparation of the program for development of the oil industry proves that labor-saving types of technical progress do not have to cause an increase in the index of capital absorption of production. The example of the oil industry fills us with optimism as to the direction of effective investments in the years 1961-1965.

The situation is different in the beer industry. Here we have an almost perfect identity of directions of the curve of labor productivity and the curve of equipment of workers with means of production. However, the curve of effectiveness of utilization of fixed capital shows an insignificant increase. It seems that this stability results from the nature of technology of production in which, from the point of view of interest to us, the decisive part is played by containers in storage places and fermentation barrels. They contribute heavily to the outlays and give the direction to the curve. It is understandable that with such a traditional character of production as that of breweries we cannot expect essential changes in the capital absorption index. However, there will be a different influence of investments in the malt industry, in which technical progress brings economies in outlays. In the sugar industry the curves of labor productivity, equipment, and effectiveness of fixed capital show a constant though very small increase. The nature of this increase is to a certain extent disquieting. It contains old forms and methods of production and low labor productivity.

In the fruit and vegetable industry (Figure 4) the position of the discussed curves is in principle correct. However, Figure 15 illustrating the curves of capital absorption calculated by the two previously given methods gives rise to serious doubts whether such a rapid rate of increase in the index of capital absorption finds justification. The effectiveness of investment outlays in 1961-1965 in that industry is low in comparison with the present period. This is illustrated clearly by the curve under discussion, showing a clear tendency to depart from the level of the index of effectiveness of fixed capital. It seems desirable to revise the designing solutions in the direction of using economical investment construction.

The development of the industry of food concentrates corresponds in principle to the general tendencies characterizing the development of the food industry as a whole. Departures from general correctness in that industry are manifested by lower dynamics of increase of effectiveness of fixed capital, labor productivity, and equipment of workers with means of production. The position of the curves of capital absorption (Figure 2) illustrates the stabilization of the index calculated by the method of increments. In the direction of this curve, the great effectiveness of the investment processes taking place in the second half of the present Five-Year Plan and in the 1961-1965 period is manifested.

This advantageous nature of the investment undertakings, consisting in maximum utilization of existing construction projects and their "machining," exerts, in turn, a decisive influence on the fall in the index of capital absorption by a comparison of the volume of the whole capital to the whole production.

The production and investment program of the candy industry is a typical example of the concept of development of an industry based on labor-saving type of investments. It follows from Figure 10 that in comparison with 1955 the effectiveness of fixed capital does not, in principle, show major changes (except for 1958, when there was a drop and subsequent stability on the level of 1955-1956).

The 1961-1965 period is characterized by a high increase in labor productivity based on an equally dynamic and almost parallel increase in equipment of workers with means of production. In comparison with the concentrates industry, the in-

vestment program of the candy industry is more capital-absorbing. At the same time it should be expected that the basic factor now arresting a further increase in capital absorption is the very rapid increase in the size of the plant. In an opposite case we encountered difficulties which would require a considerable increase in investment outlays to overcome.

Special attention is merited by the meat industry. The indices of capital absorption of production and the remaining magnitudes were calculated in two alternatives. On the assumption of the complete elimination of the influence of unutilized productive capacity in 1955 (Figure 2), we observe a drop in the effectiveness of productive capital by 1965.

An interesting phenomenon in this industry is the 1955-1958 period, in which the increase in productivity was hardly at all influenced by technical progress and investments (a fall of the curve illustrating the equipment of workers with means of production). Since 1958, the interdependence between these magnitudes has been different. Also characteristic is the shape of the curve illustrating the effectiveness of utilization of capital. After the 1955-1958 period, in which the level of effectiveness reached the highest point, it gradually falls in 1959-1965. On the assumption of the complete elimination of the influence of unutilized productive capacity, the level of the index of effectiveness is slightly lower than in 1955, and in connection with this it would be possible finally to formulate the thesis that the index in the industry shows a tendency to be stable.

Passing to a discussion of the last group of industries, in which the indices of capital absorption show a tendency to increase strongly, it is necessary to stress that this group also has in common the fact that the increase in equipment of workers with means of production is much faster than increase in labor productivity. This applies to the egg and poultry, milling, tobacco, and partially to the potato industries. In spite of this, the index of increase in productivity is exceptionally low (Figures 6, 8, 9, 11). Most disquieting is the position of the curves in the egg and poultry industry, whose program requires a considerable correction of the real scope of planned investments.

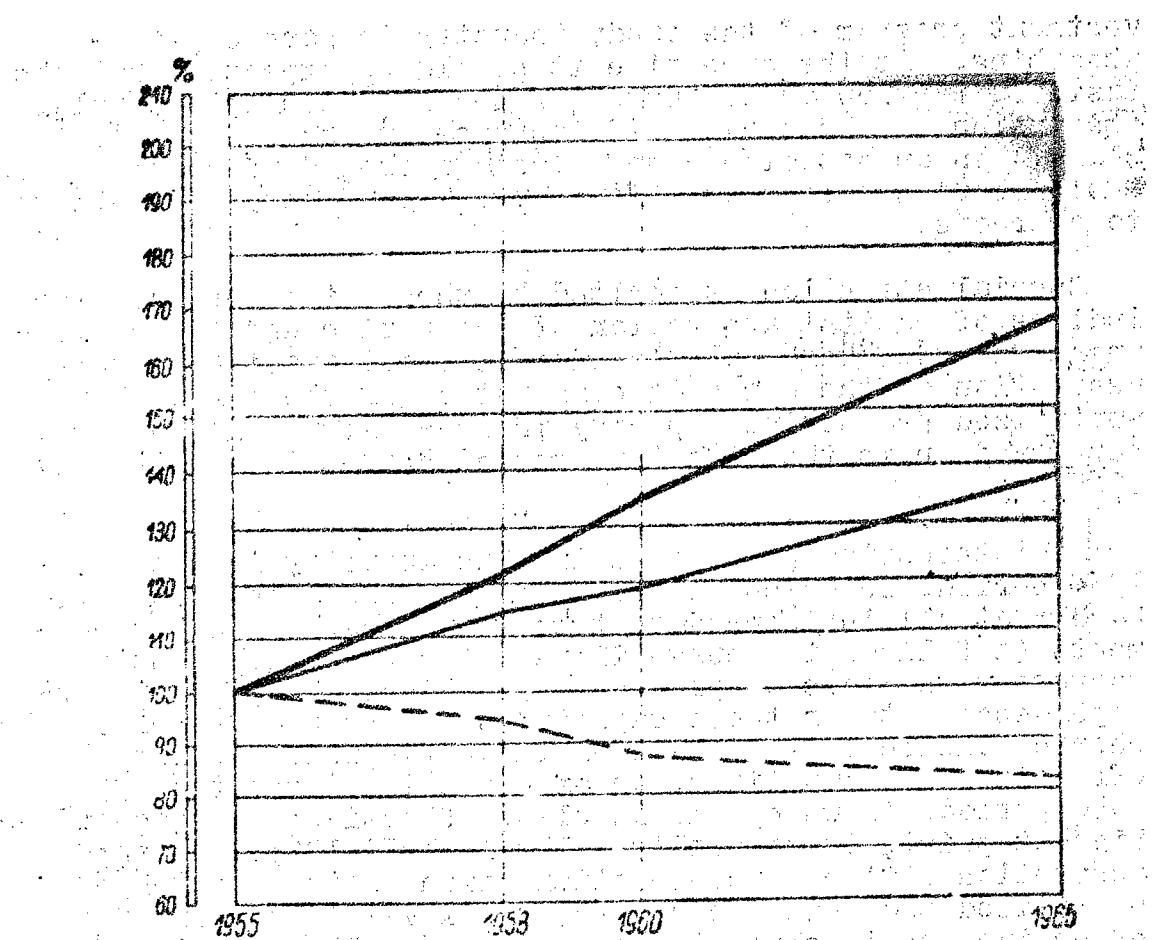


Figure 1

[Presumably, the Meat Industry], Eliminating the Influences of Unused Productive Capacity in 1955 on Capital Absorption of Production

- labor productivity
- fixed capital per worker
- production per unit of fixed capital

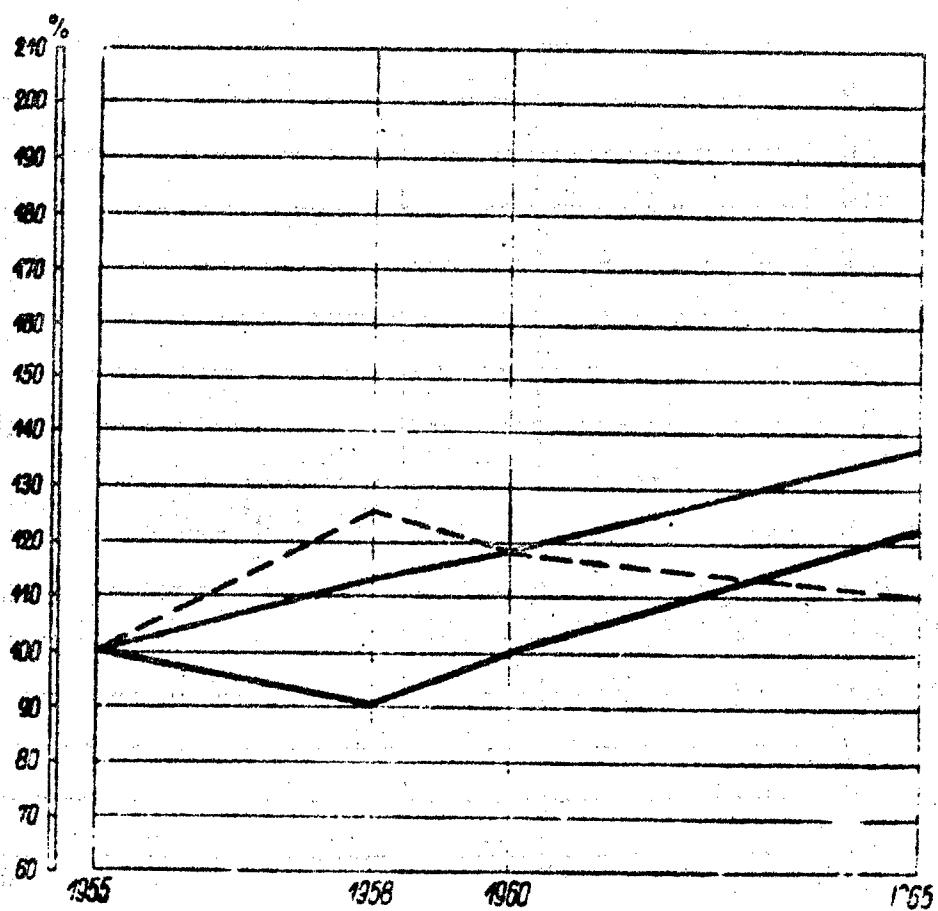


Figure 2

[Presumably, the Meat Industry], Without Eliminating the Influence of Unused Productive Capacity on Capital Absorption of Production

- labor productivity
- fixed capital per worker
- production per unit of fixed capital

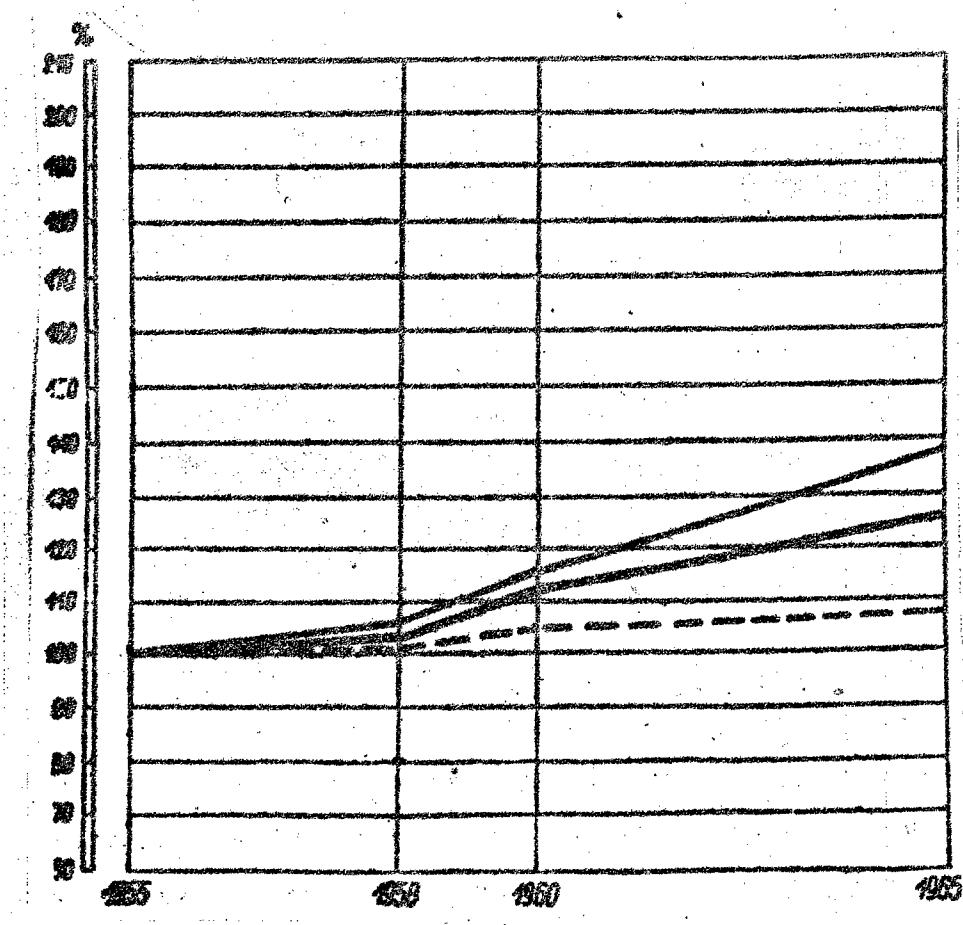


Figure 3
The Sugar Industry

- labor productivity
- fixed capital per worker
- - - production per unit of fixed capital

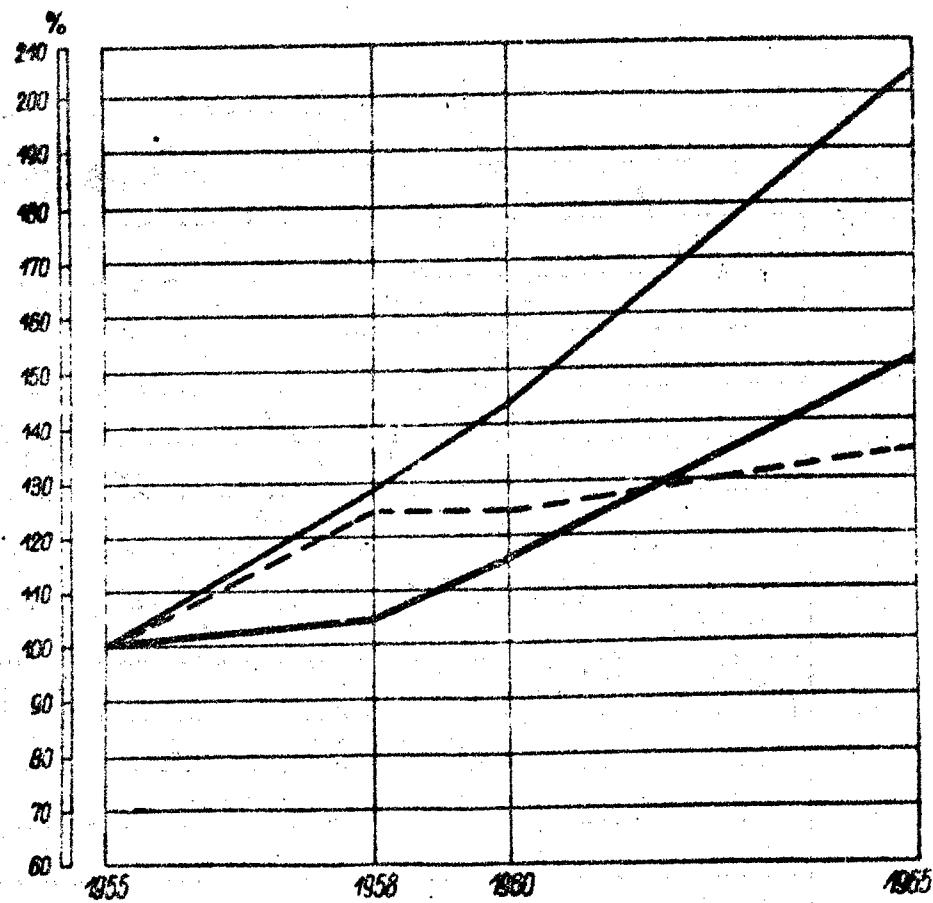


Figure 4

The Fruit and Vegetable Industry

- labor productivity
- fixed capital per worker
- production per unit of fixed capital

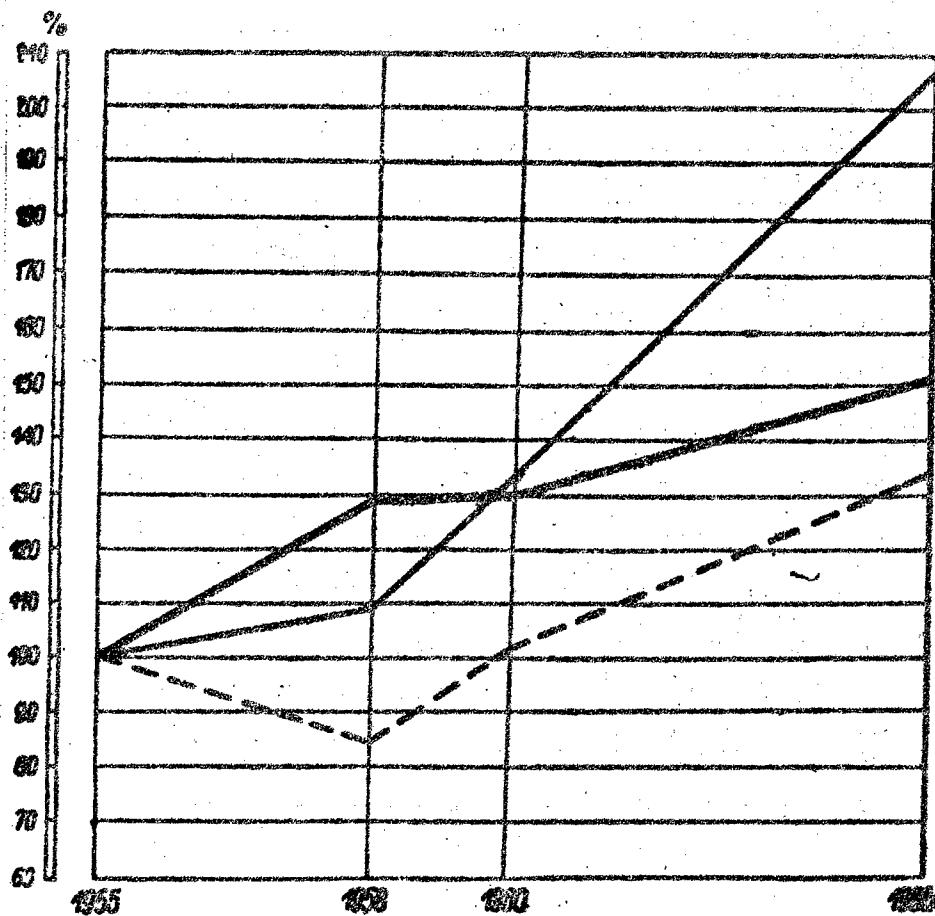


Figure 5
 The Oil Industry

— labor productivity
 — fixed capital per worker
 - - - production per unit of fixed capital

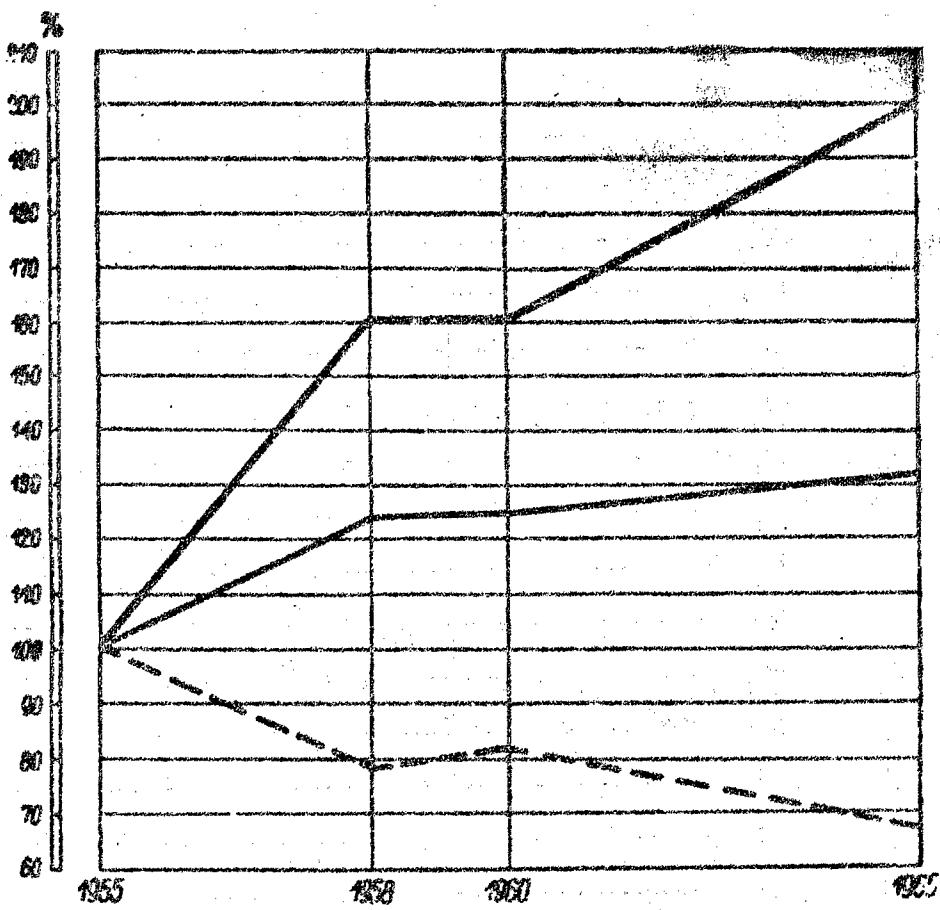


Figure 6

The Egg and Poultry Industry

- labor productivity
- fixed capital per worker
- production per unit of fixed capital

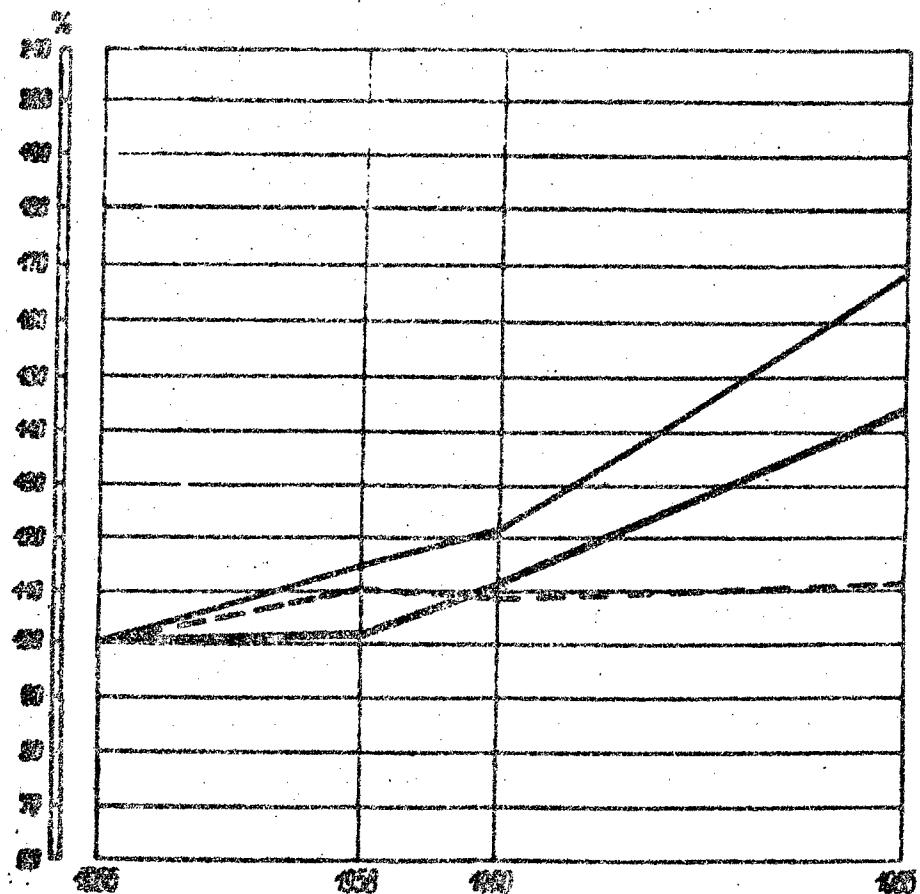


Figure 7
The Beer Industry

- labor productivity
- fixed capital per worker
- production per unit of fixed capital

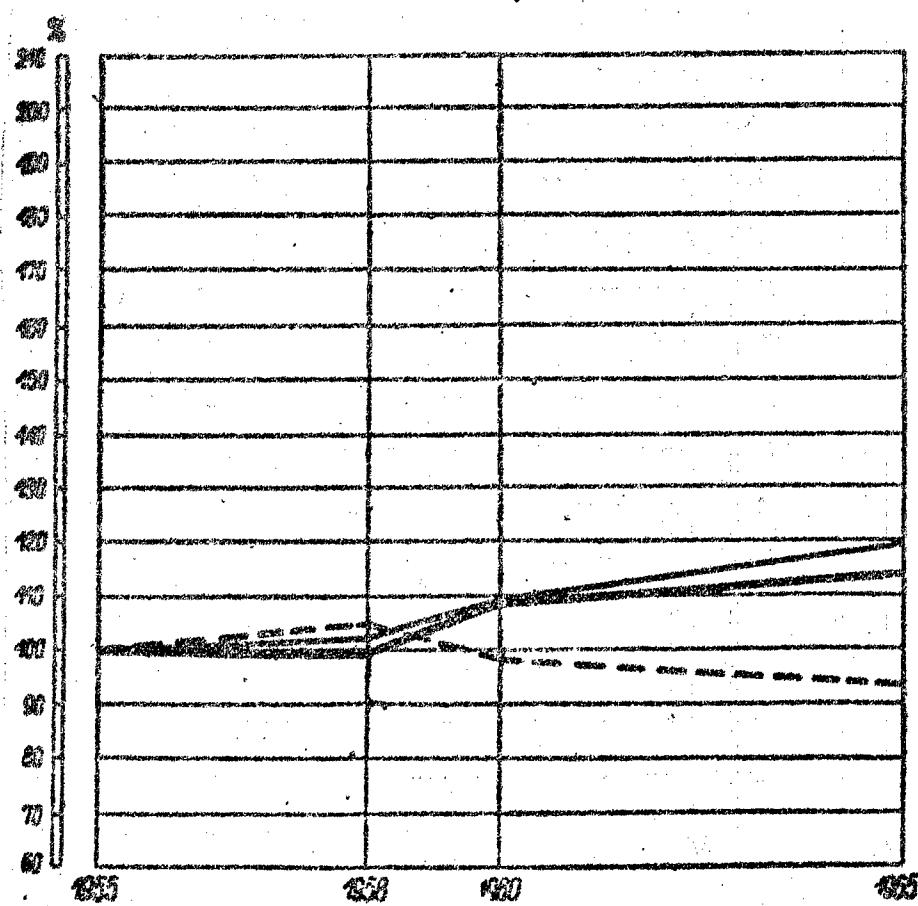


Figure 8
The Potato Industry

- labor productivity
- fixed capital per worker
- production per unit of fixed capital

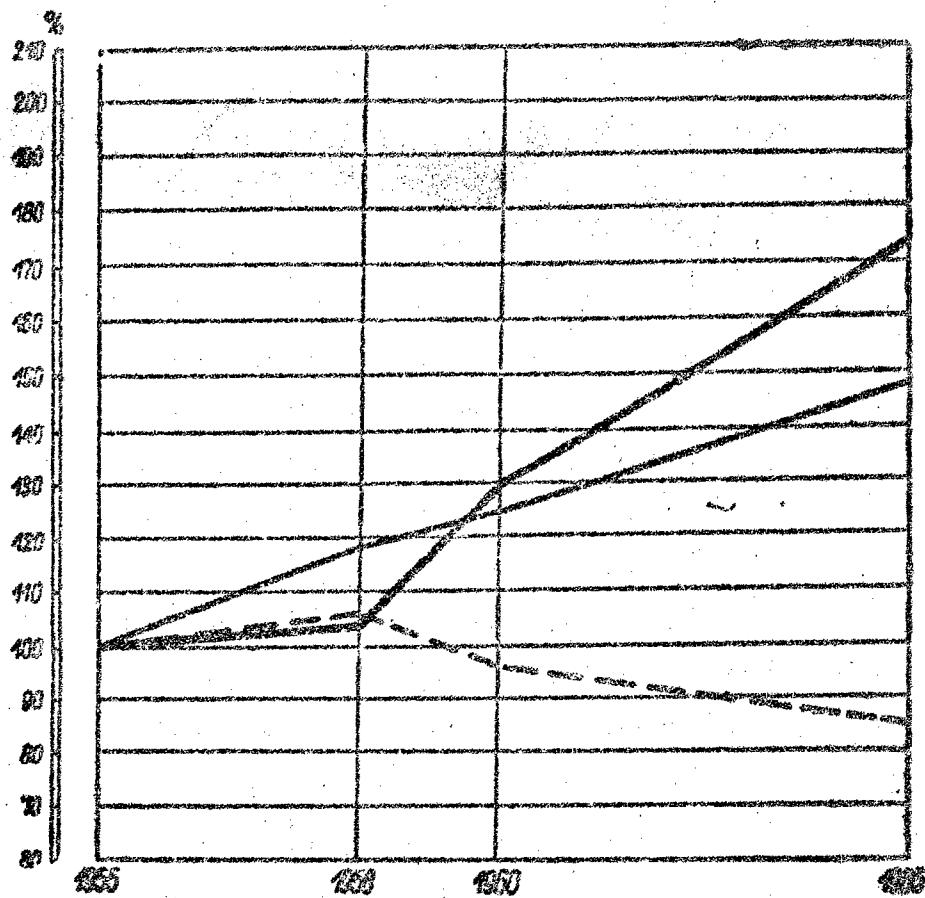


Figure 9
The Tobacco Industry

— labor productivity
— fixed capital per worker
- - - - production per unit of
fixed capital

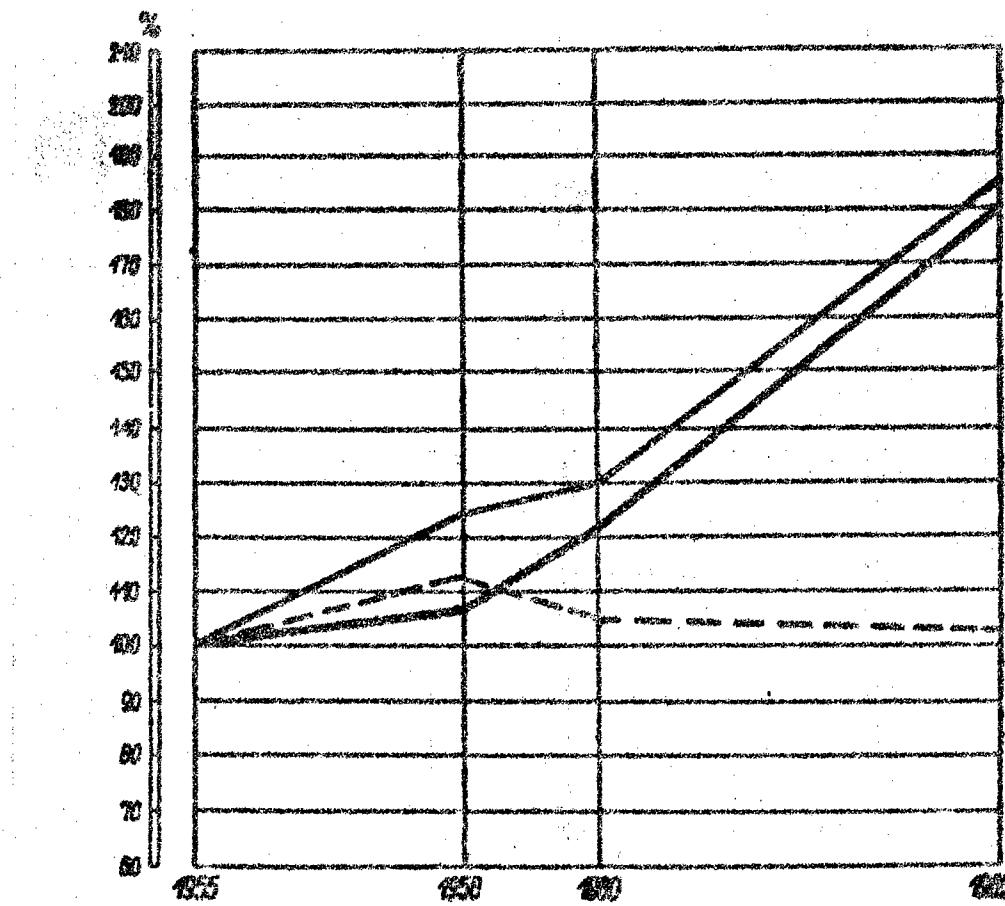


Figure 10
The Candy Industry

- labor productivity
- fixed capital per worker
- - - production per unit of fixed capital

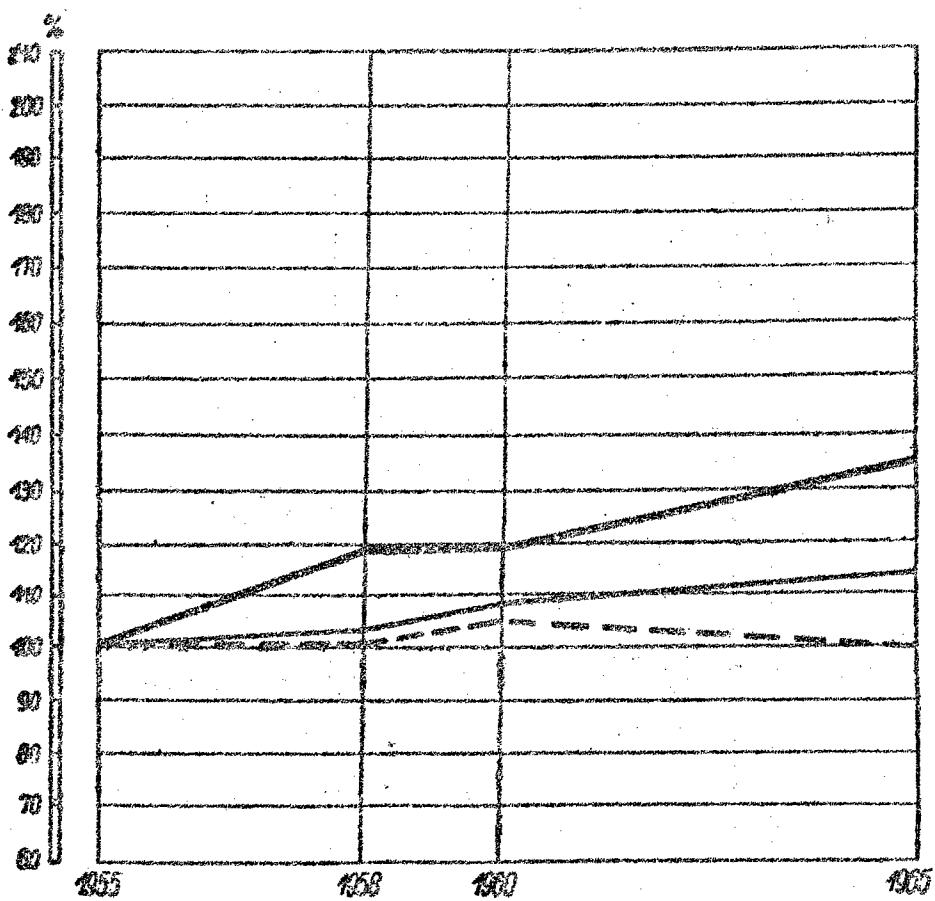


Figure 11

The Milling Industry

- labor productivity
- fixed capital per worker
- production per unit of fixed capital

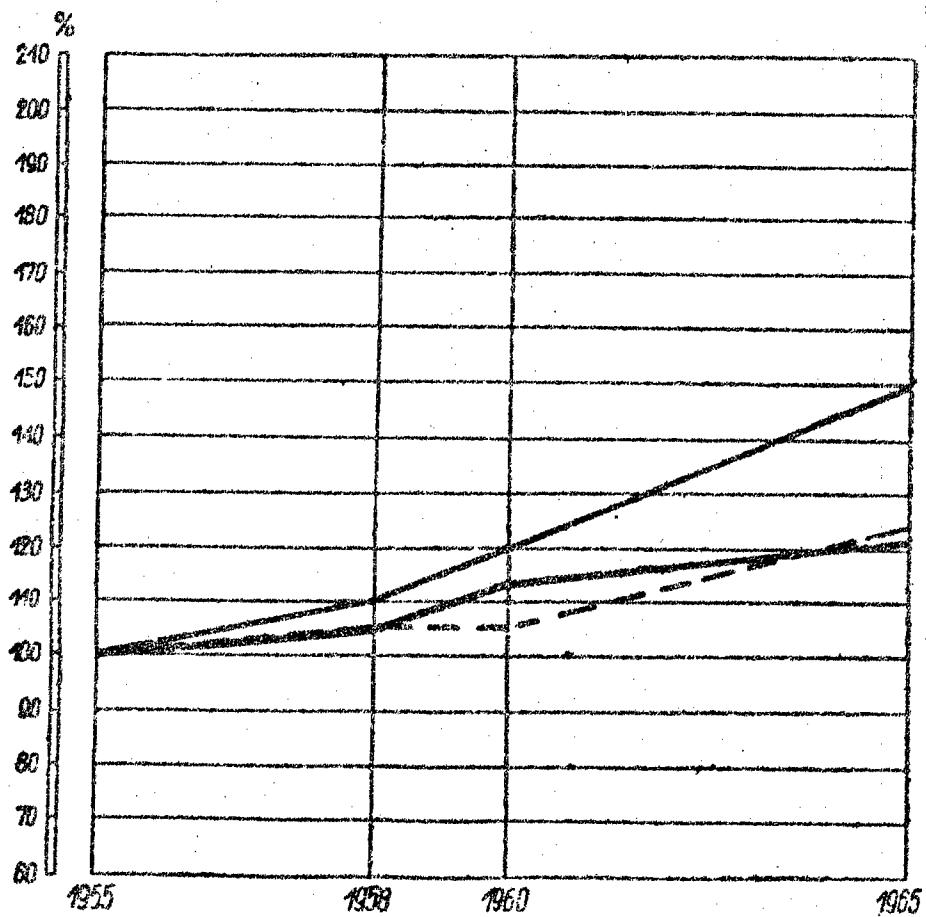


Figure 12
The Food Concentrates Industry

- labor productivity
- fixed capital per worker
- - - - production per unit of fixed capital

[In the following figures (13 through 24) the symbols used have the following significance:]

P = value of production in the given period

ΔP = increment in the value of production in the given period

M = fixed capital (according to replacement value) in the given period

ΔM = increment in fixed capital (according to replacement value) in the given period.

[The legend of each of these figures is:]

$$\frac{\Delta M}{\Delta P}$$

$$\frac{M}{P}$$

[The figures in the vertical axes represent zlotys (1958 prices) per zloty of value of gross production.]

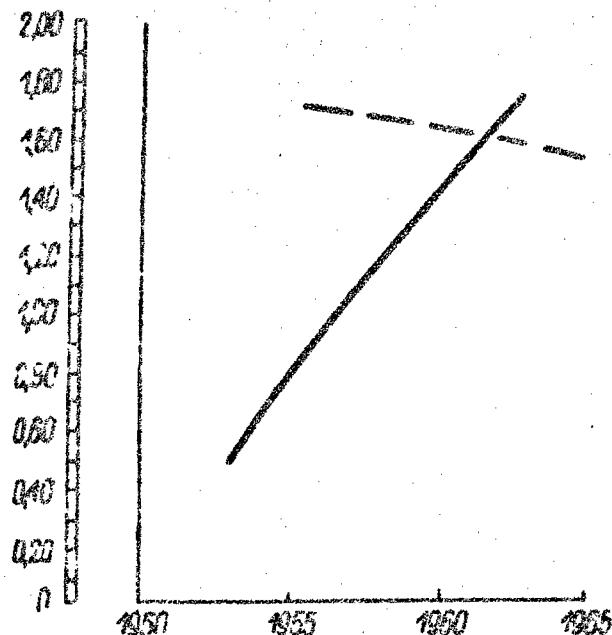


Figure 13
The Sugar Industry

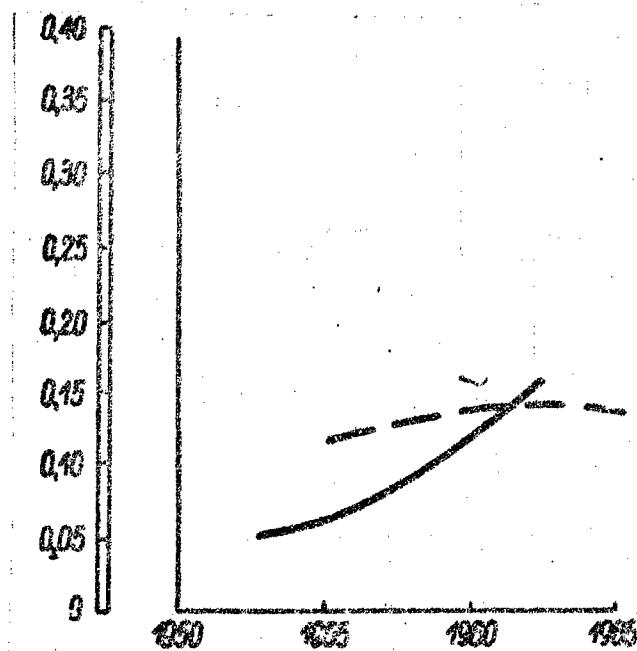


Figure 14. The Meat Industry

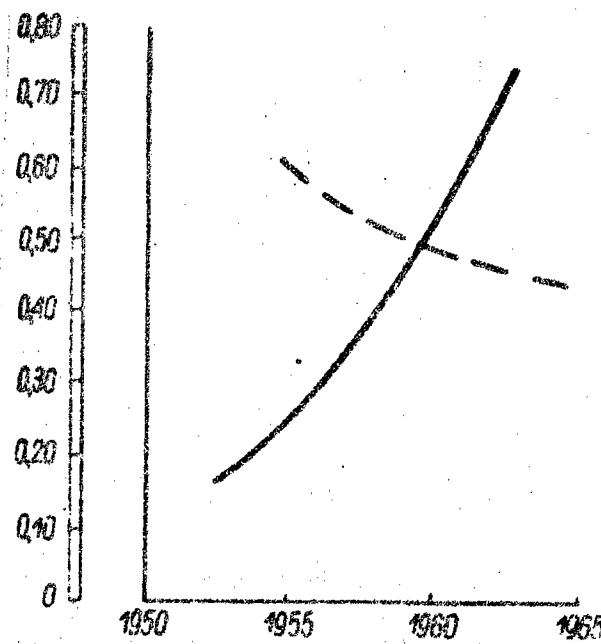


Figure 15. The Fruit & Vegetable Industry

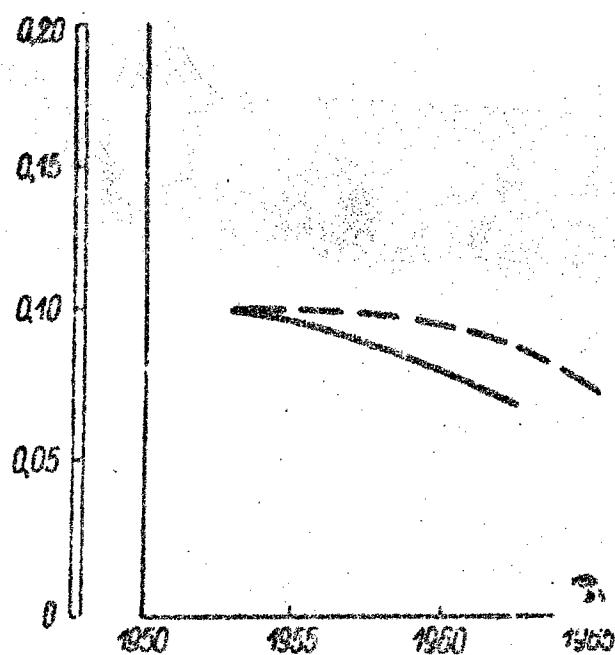


Figure 16. The Oil Industry

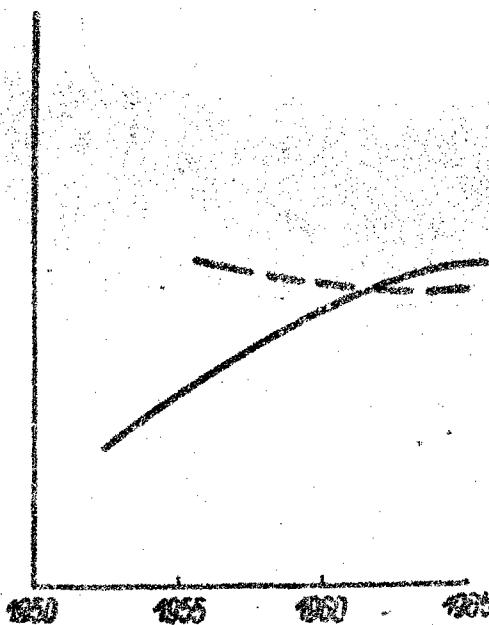


Figure 17. The Beer Industry

[Figures for vertical axis omitted from source]

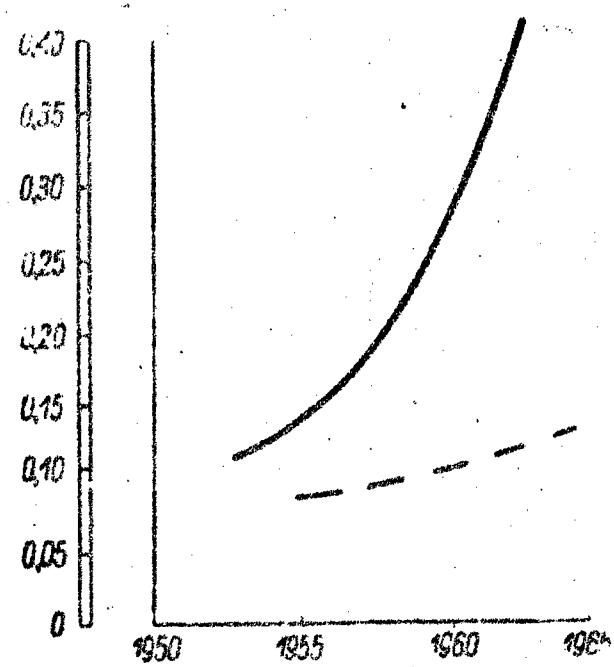


Figure 18. The Egg & Poultry Industry

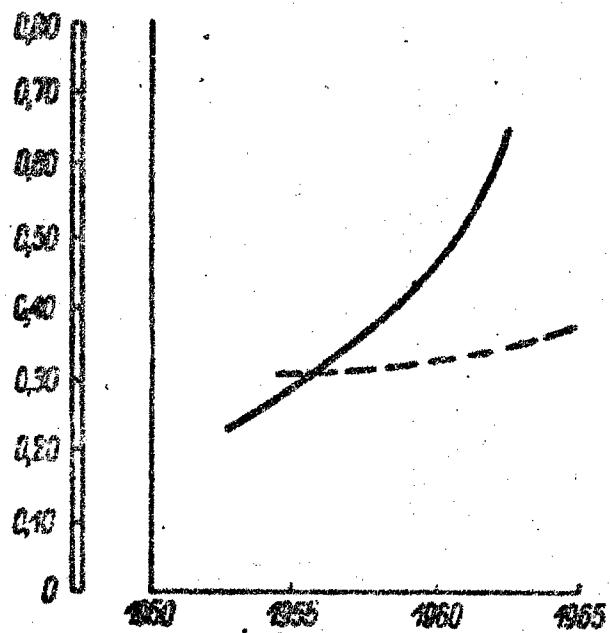


Figure 19. The Tobacco Industry

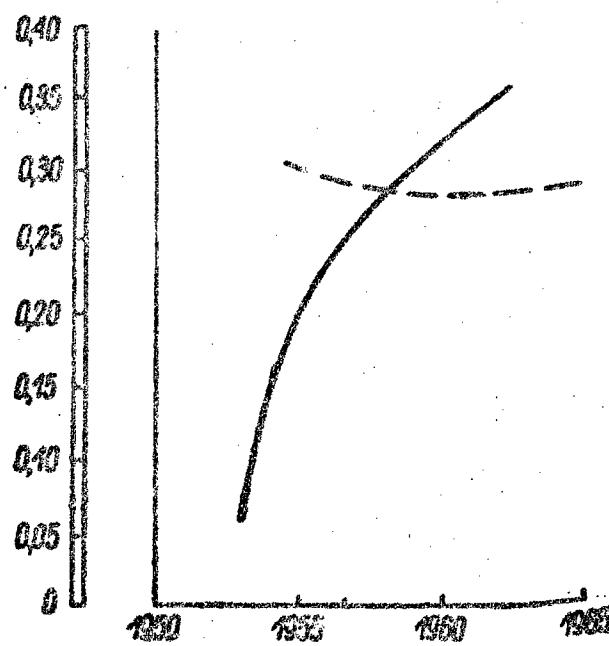


Figure 20. The Candy Industry

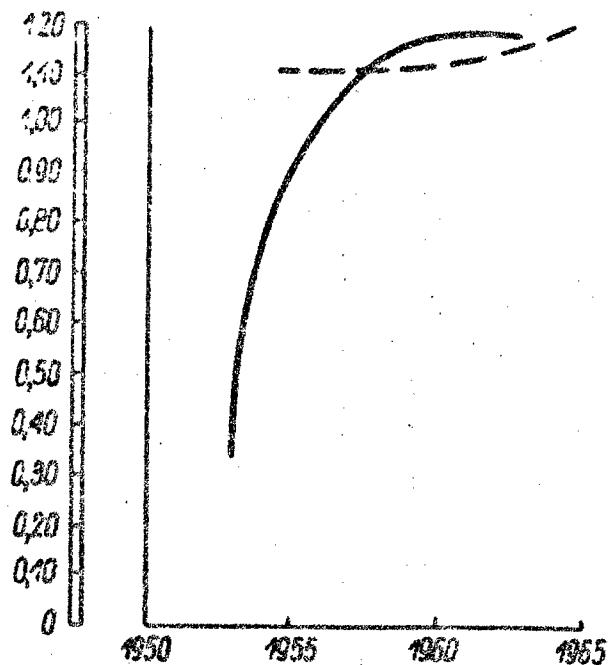


Figure 21. The Potato Industry

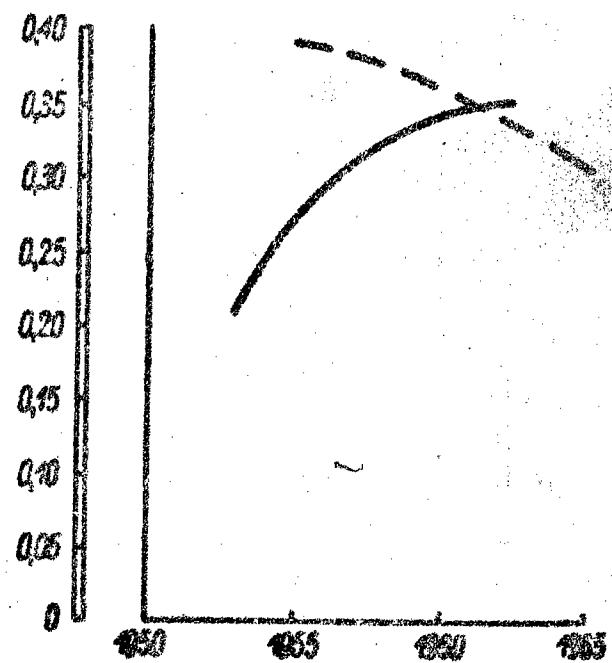


Figure 22. The Food Concentrates Industry

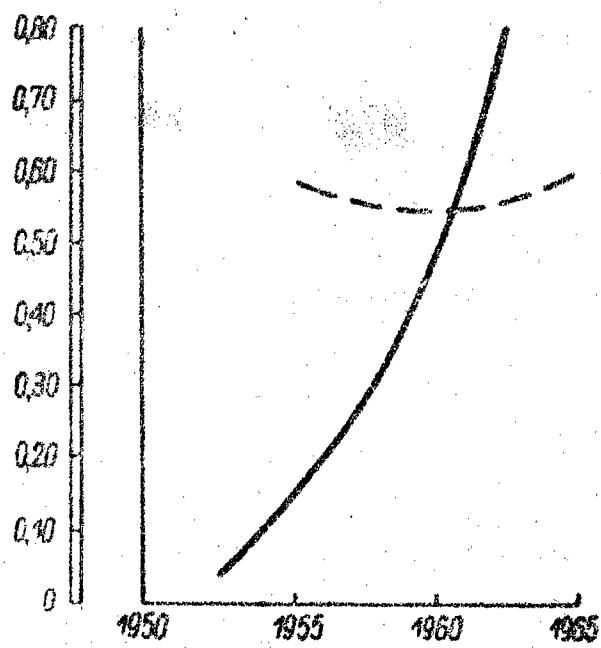


Figure 23. The Milling Industry

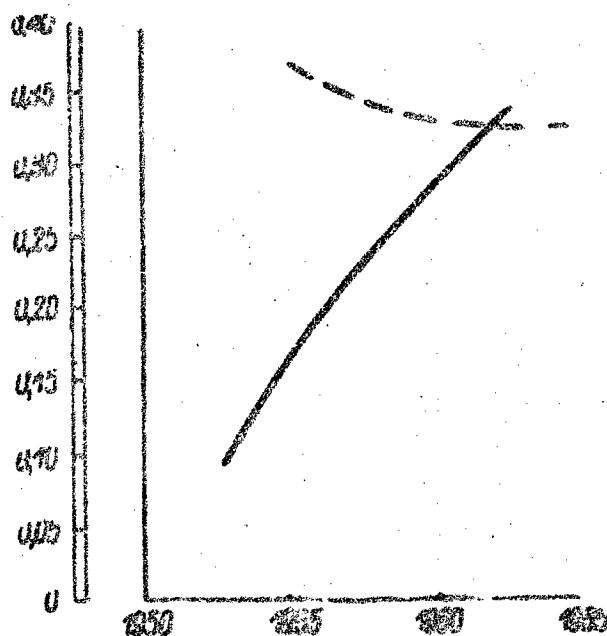


Figure 24. The Herb Industry

Final Remarks and Conclusions

The conclusions will be limited to the following basic problems:

- 1) Despite the increase in capital absorption of production measured by comparing the ratio of increment in investments to the increment in production, the effectiveness of fixed capital increases. This is manifested in a drop in the index of capital absorption measured by comparing the ratio of fixed capital to production.
- 2) A study of the above-mentioned ratios indicates the formation of marginal capital absorption, which is of basic importance for the determination of the further direction and rate of investments. In the situation of the food industry, the phenomena of exceeding marginal capital absorption must be investigated in detail. This excess can be justified only by a correspondingly rapid increase in labor productivity.
- 3) On this basis, a detailed analysis is required for the investment programs of the egg and poultry, milling, tobacco, potato, and fruit and vegetable industries.

4) In view of the limited investment resources it becomes necessary to accept an alternative program, taking into account the rapid development of the productive capacities and the moderate development of technical progress.

5) Particularly economical planning should be used in industries with a high branch capital absorption resulting from the natural character of the investments (sugar, beer, potato, and milling). In these industries labor-savings types of technical progress should be introduced at a slower rate than in the remaining branches of the food industry, unless the technical progress creates conditions for a considerable reduction in capital absorption.

6) In view of the proved influence of the size of project on the level of unit capital absorption, it will be necessary to construct large projects, and the rate of increase of the average size of plants will differ according to the extent of the ties of the given branch with agriculture and the rate of increase of production of the given branch of industry.

7) The effectiveness of renovation investments is underestimated and requires more exact calculation. In connection with this, the scope of new investments may be decreased.

8) An evaluation of the effectiveness of investments must take into account the time element, which, in the present considerations on the sector of food industry, was not done.

POLAND

Perspectives of Development of the Egg and Poultry Industry in the Second Five-Year Plan

[This is a translation of an article by Jerzy Szeliga of Warsaw in Przemysl Spozywczy, No 11-12, November-December 1959, Warsaw, pages 519-524; CSO: 3782-N/3]

There is probably no need to justify the role of egg and poultry products in correct nutrition; it suffices to stress that the production of eggs and poultry in 1938-1959 increased very considerably. In the USA the increase in the production of eggs reached 188 percent, in Holland 194.3 percent, in Japan 223 percent, in East Germany 151 percent, and in Canada 204 percent. The constant progress of research work in breeding considerably lowered the costs of production, especially in intensive breeding, which created advantageous conditions for wide development of large farm, industrial production. For example, the yield of 200 eggs per hen was attained, and in the breeding of slaughter poultry the feed consumption per kilogram of meat was less than 3 kilograms.

This permitted an effective competition of egg and poultry products with other food products, and eggs and poultry moved from a supplementary position to the group of products of basic importance.

The consumption of eggs and poultry in Poland is as yet not high. In 1956 it was as follows, in per capita averages:

Country	Number of Eggs	Poultry in Kilograms
USA	409	14.5
West Germany	205	5.0
Great Britain	211	3.5
Canada	281	12.2
Italy	157	-
Poland	137	2.0

The Five-Year Plan (1961-1965) assumes an increase in egg consumption to 160 at the end of 1965 and to 2.8 kilograms per capita of poultry. Taking into account the expected

population increase, the increase in the quantity of eggs to fulfill these assumptions will be 141.2 percent, and of poultry 257.2 percent over 1958. Despite the apparently high indices, this increase still does not safeguard the postulate of the minimum diet of Group A, which, according to indicator of Prof A. Szczygiel, amounts to 182.5 eggs.

In addition to the needs of the domestic market, there is also the need to maintain and widen exports of eggs and poultry. Contributing to this is the long tradition, and therefore the established markets, and the profitability of the export itself. The index of increase in export at the end of the Five-Year Plan will, in comparison with 1958, be 187 percent in eggs and 156 percent in poultry.

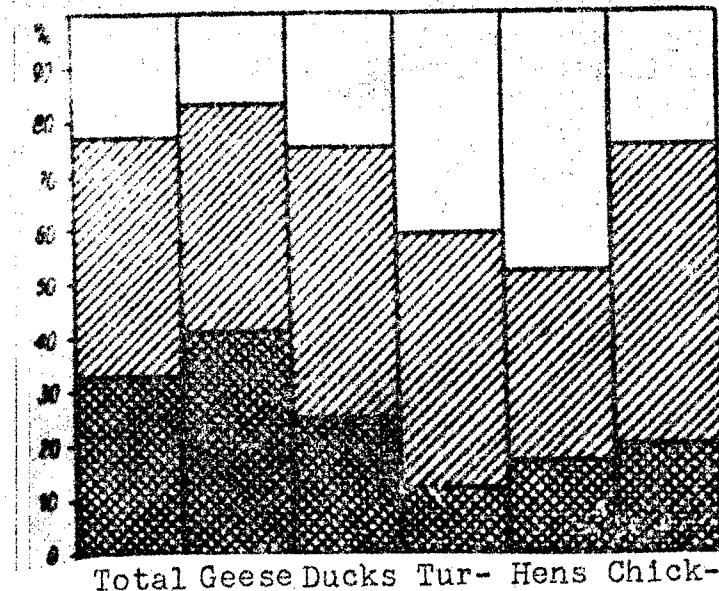


Figure 1

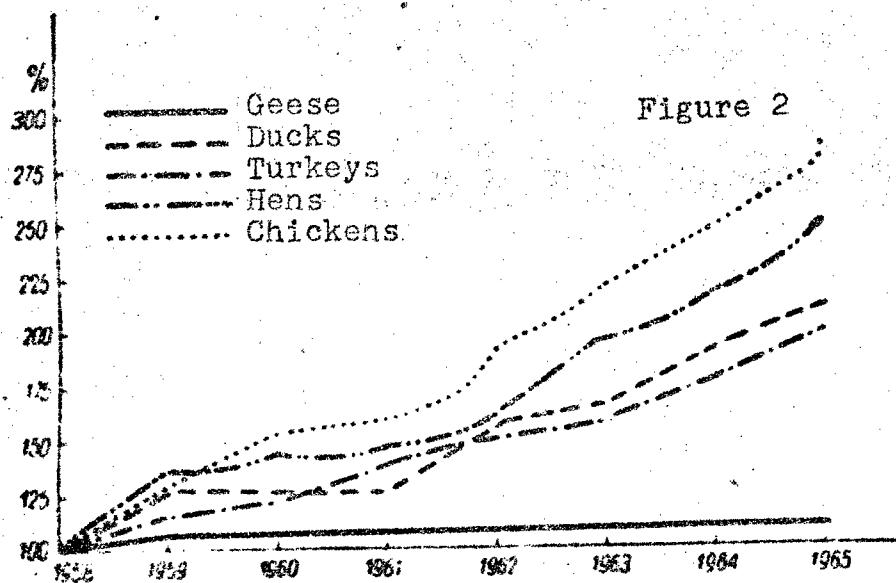
- Standard A
- ▨ Standard B
- Standard C

In the production of eggs and poultry in Poland, 96 percent has so far been based on small commodity farming--peasant farming. The breeding conditions are rather primitive; mixed breeds of poultry of a low degree of usefulness predominate. A result of this situation is the still low percentage of poultry of high commercial value (Figure 1). The index of egg yield is also low and places our country, with an average of 90 eggs per hen per year, in one of the last places in Europe (Denmark--225, Holland--200, USA--185, Great Britain--180, Norway--140, Austria--120). To this we must add the fact that we are approaching the maximum number of poultry per

100 hectares of usable land that is possible under the present breeding conditions.

The development assumptions of the poultry industry must therefore be based not so much on quantitative increases in the raw material base in extensive farming but on its intensification (housing conditions, feeding, quality of breeding material, etc.). In egg production a comparatively small increase in hens is assumed (119 percent), and the basic source of increasing the supply is to be a greater yield per hen. It is planned to attain 105 eggs per hen in 1965, which would constitute an index of increase in gross production of 138.6 percent. It is planned to improve the breed of hens by introducing cross-breeds with pure breeds. Further development of farm production is assumed, conducted by peasant farms specializing in egg and poultry production. One of the main conditions for increasing egg production will be a general improvement in feeding (particularly in the autumn and winter periods). Apart from increasing supply, the above steps will ease the seasonal nature of production.

The development of poultry production is based mainly on "scratching fowl." Important increases in geese are not expected in view of the slow liquidation of grazing grounds and unused lands (Figure 2).



The expected increase in slaughter poultry in the case of ducks and chickens is connected with the necessity of expanding farm production. The general problem will be the quality of the material, and for this reason the plans assume a considerable increase in artificial hatching from nearly 20 million in 1958 to 45 million in 1965, which will permit the introduction of rational breeding.

Despite the comparatively easy processing methods, the egg and poultry industry has very extensive technological problems. This results on the one hand from wide assortments of production and on the other hand from the tremendous progress of world technique. The components of egg production are: 1) segregation of fresh eggs; 2) conservation of eggs; 3) production of egg mass; 4) production of egg powder.

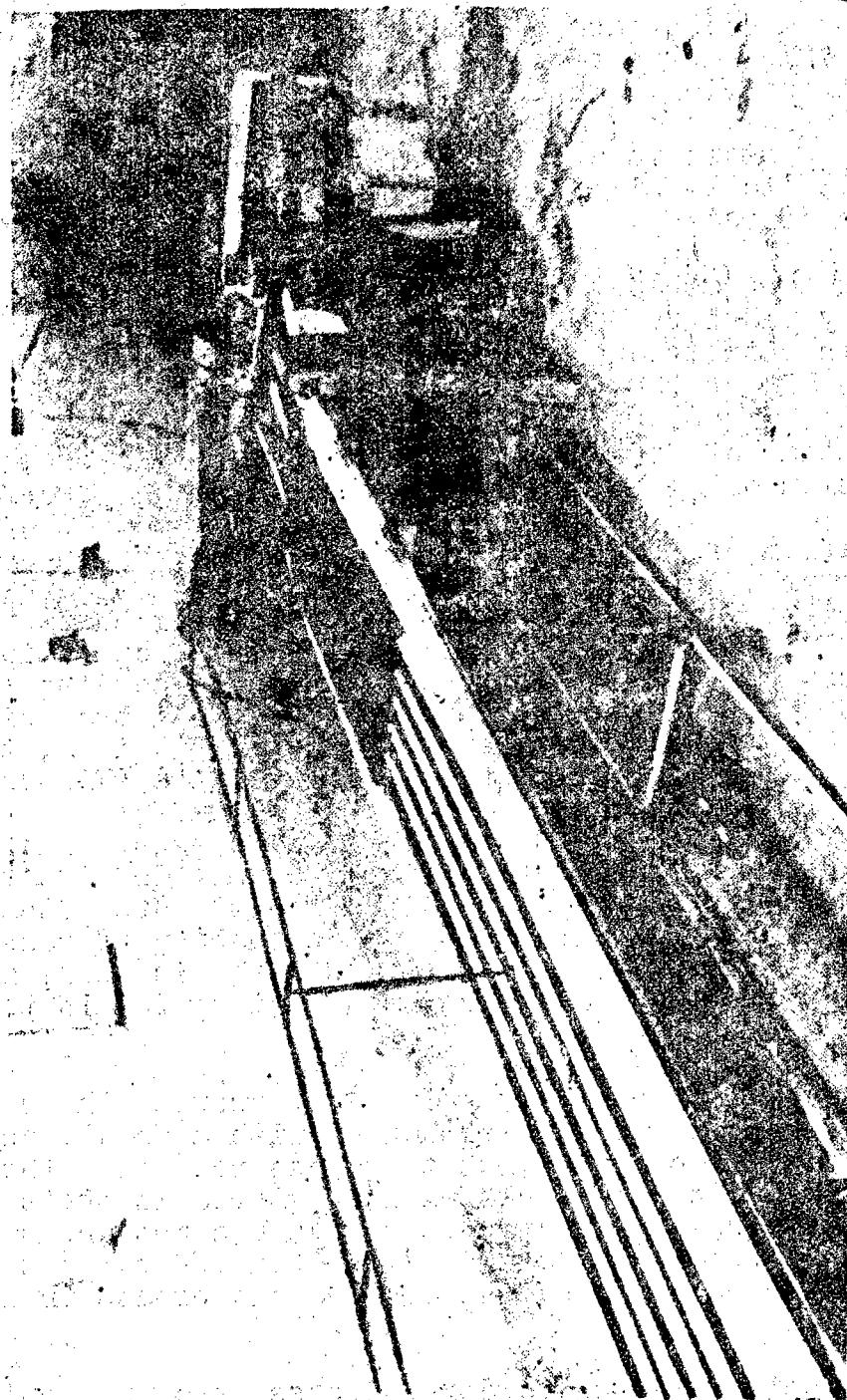
Segregation of eggs is in principle an operation of a commercial nature; it consists in dividing eggs according to quality criteria. The basic problem here is mechanization, because of the high labor absorption of these operations. The processing of eggs, outside of sorting according to weight, is done by hand, but even now we are introducing aggregates which will reduce manual work to a minimum; this also permits better utilization of production space (Figure 3).

An important problem is conservation of eggs. The method of dipping eggs into hydrogen oxide of lime, despite the comparatively low operating costs, is more and more often abandoned because of the poor organoleptic quality of conserved eggs. More often eggs kept in cold storage is used, where eggs kept for three to five months do not differ in taste from fresh eggs.

In the 1959-1965 period the industry assumes the construction of three cold storage warehouses with a total capacity of about 50 million eggs. But this does not solve the problem, and the basic egg stocks will be stored in state cold storage warehouses. The Five-Year Plan assumes an increase in the share of cold storage eggs to about 89 percent (at present 50 percent), with a simultaneous decrease in limed eggs.

The production of egg powder and mass is of a supplementary nature. It will be increased in strict proportion to the increase in total egg-processing. It is planned to expand the variety of egg-processing by introducing the production of crystallic albumen, mayonnaise, and frozen white and yolk.

Figure 3



Poultry processing consists of the following sections:
1) fattening of poultry; 2) slaughter and cleaning of poultry;
3) production of preserves; 4) processing of feathers.

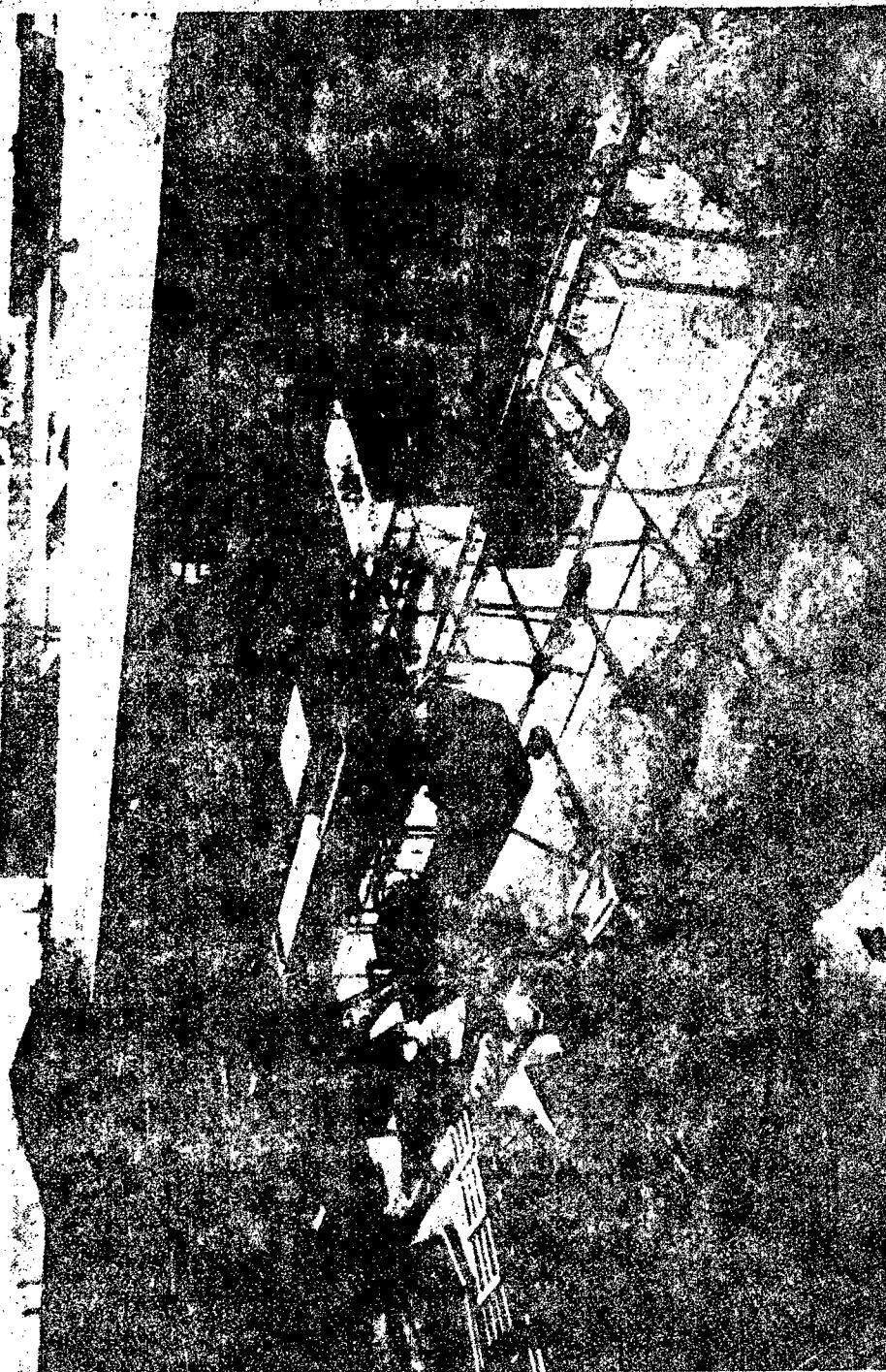
Fattening of poultry applies solely to water fowl--that is, to geese and ducks. To date most of the so-called classic fattening, based on pure oats, has been used. It brings increasingly advantageous results, improving the taste characteristics and commercial value of fowl, but it is a very expensive undertaking. In this field it seems necessary to introduce multi-component granulated mixtures and to use more bulky feeds. The industrial fattening of chickens based on intensive breeding of chicks up to 10 weeks has a great future. The expansion of this type of fattening will require the construction of separate combines embracing the full cycle of production from hatching to slaughter.

The slaughter and cleaning of poultry will already be technically much improved in 1960. The majority of poultry slaughter-houses will be equipped with Danish and Dutch installations for cleaning of scratching fowl, which will considerably increase their productivity capacity. These installations perform, in turn, the operations of steaming, removal of feathers, washing and singeing. Installations for cleaning of water fowl will also be imported (Figure 4).

These import installations will eliminate the currently encountered technical disadvantages by introducing the so-called wax mass, which, placed on the fowl, will then be removed with the feathers.

Basic changes will also apply to the methods of chilling poultry. In place of the currently used cooling chambers, it is planned to introduce a water-air system by which the process of chilling will take place in water containers at temperatures from zero degrees to +4 degrees centigrade, after which, when the meat reaches a temperature of 10 degrees centigrade above zero or less, the poultry will be additionally chilled and dried in refrigeration tunnels. This system will greatly increase the capacity of the cooling space. In canning, the basic direction of development is limited to further improvement of the quality of canned goods of the luxury type, mostly for export, and to a considerable increase in the production of popular canned goods for the domestic market.

Figure 4.



The expected growth of the industry in 1959-1965 calls for a considerable rise in productive capacity. The general direction of development is all-embracing modernization of plants, which in poultry processing will bring an increase of about 35 percent in productive capacity and about 19 percent in egg processing. The remaining needs will be supplemented by new construction.

The egg and poultry industry is a seasonal industry, and the duration of the full campaign in both the egg and in the poultry season lasts about 100 days (Figure 5). Thus, an important problem is to overcome the seasonal nature of the supply by spreading the delivery of the material over a longer period of time.

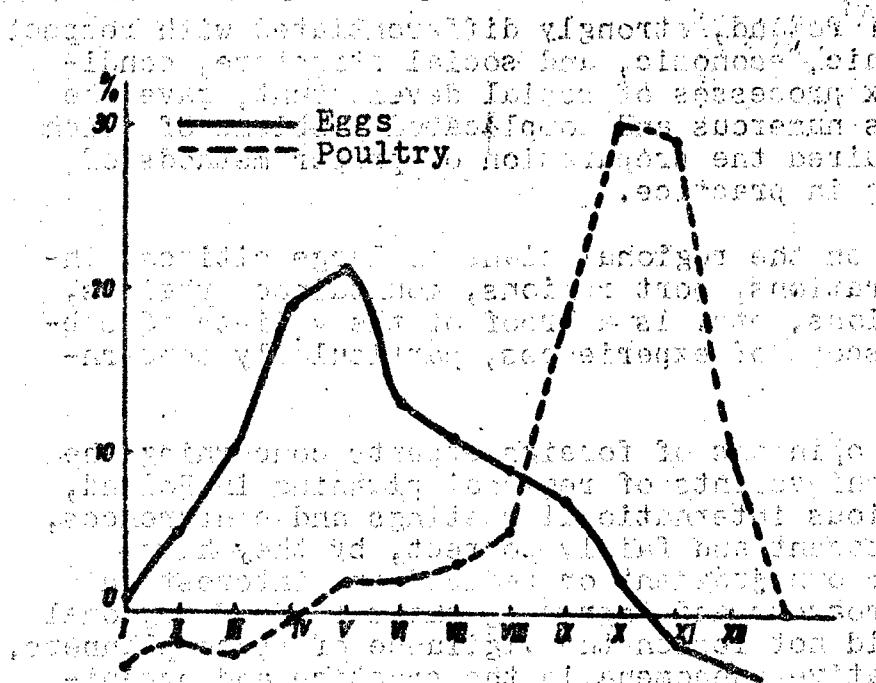


Figure 5. Seasonal distribution of egg and poultry production in the Soviet Union.

This problem is of basic importance to industry because: 1) it will permit full supplying of the domestic market with fresh egg and poultry products; 2) it will greatly improve the economics of export; 3) it will eliminate economic losses connected with accumulation of the raw material; and 4) it will facilitate better utilization of the productive capacity of plants.

Despite the comparatively unfavorable climatic conditions, there are real possibilities for overcoming the seasonal pattern. In the case of eggs, this is connected with prolonging the period of laying eggs to autumn and winter, and in the case of poultry with earlier breeding and sale. However, the achievement of this depends on the general improvement of breeding conditions and particularly their intensification.

POLAND

New Prospects for Regional Planning

[This is a translation of an article by Jozef Zaremba in Miasto, Vol X, No 12, December 1959, Warsaw, pages 1-7; CSO: 3768-N]

Regional planning in Poland already has a more than 30-year-old tradition and it achieved results in the interwar and postwar periods which won considerable recognition among space planners in many countries.

The regions of Poland, strongly differentiated with respect to their geographic, economic, and social structure, conditioned by complex processes of social development, gave the regional planners numerous and complicated problems of which the solution required the preparation of proper methods of work and checking in practice.

The work done on the regional plans of large cities, industrial concentrations, port regions, mountainous regions, recreational regions, etc. is a proof of the variety of subject matter and scope of experiences, particularly concerning methodology.

The favorable opinions of foreign experts concerning the methodological achievements of regional planning in Poland, expressed at various international meetings and conferences, are of course pleasant and fairly correct, but they have never clouded our own judgment or reduced our interest in making further progress and improving the method of regional planning; they did not lessen the vigilance of space planners, who also saw negative phenomena in the practice and organization of regional planning in Poland.

However, the purpose of this article is not to give a detailed analysis of the advantages and errors of regional planning in the past years but, in connection with the past, to describe the actual state of regional planning in terms of the needs which emerge on the basis of development plans for the national economy.

The following general conclusions can be drawn from an analysis of the experiences of regional planning in People's

[See page 1]

Poland in the past years; they influence the current situation and partly also the future.

1. First of all it is necessary to state that in the postwar period, in 1947-1957, a total of 29 regional studies of various size, subject-matter, and territorial range were made. The majority were in the form of draft plans. This is a document expressive of the great achievements of regional planning. The map in Figure 1 shows the type and range of these regional studies.

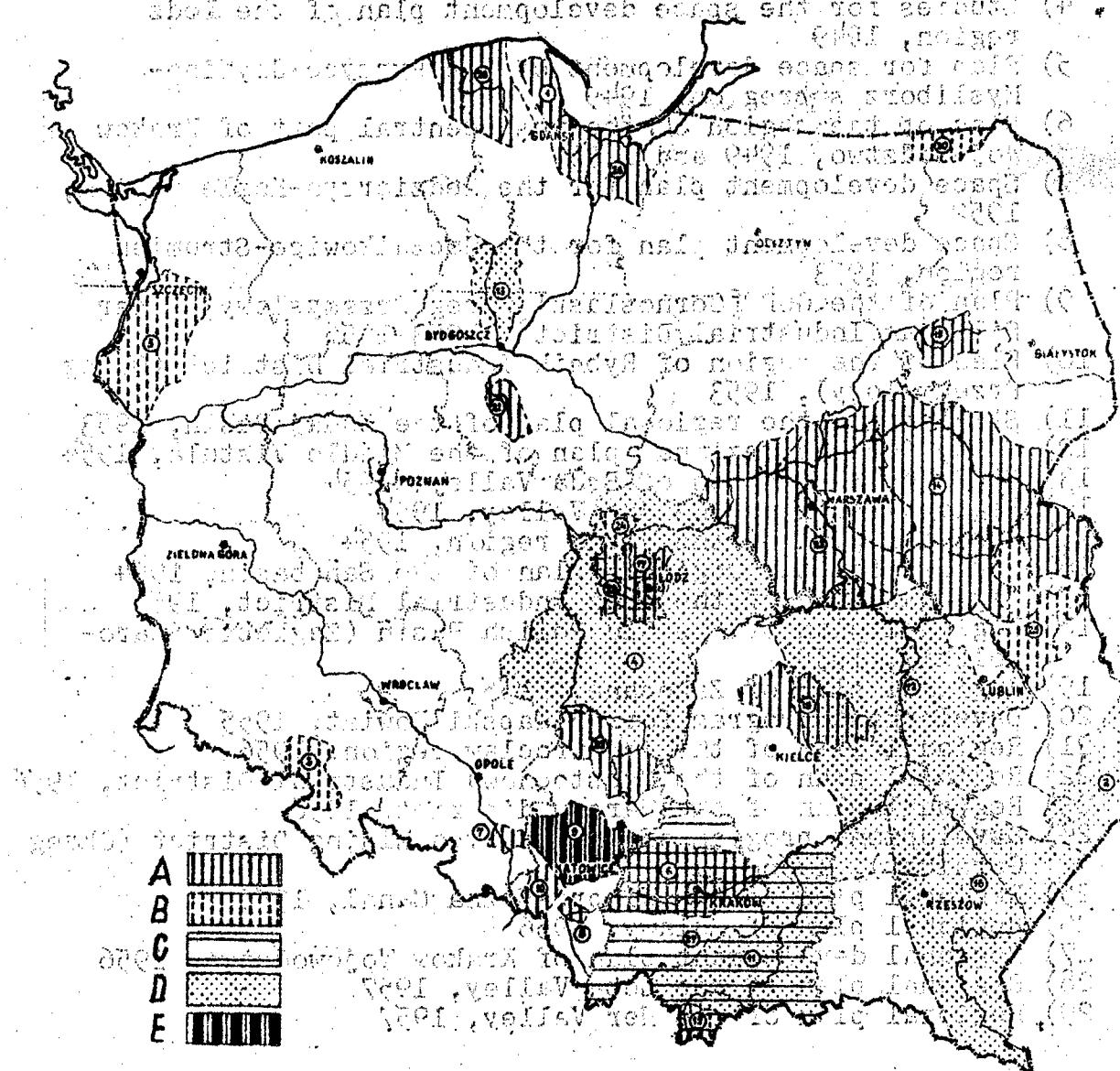


Figure 1. Map of Regional Studies Made in 1946-1957

[See following page for legend]

[Legend:]

- A) Draft plans
- B) Simplified studies (expert opinions)
- C) Experimental studies
- D) Studies
- E) Plan confirmed by a resolution of the Council of Ministers

- 1) Plan of the Gdansk Bay region, 1947
- 2) Studies for the space development plan of the Tomaszow-Hrubieszow Powiats, 1948
- 3) Regional plan of the Walbrzych region, 1949
- 4) Studies for the space development plan of the Lodz region, 1949
- 5) Plan for space development of the Pyrzyce-Gryfino-Mysliborz subregion, 1949
- 6) Plan of the region of the west-central part of Krakow Wojewodztwo, 1949 and 1955
- 7) Space development plan for the Kedzierzyn-Kozle region, 1952
- 8) Space development plan for the Goczalkowice-Strumien region, 1953
- 9) Plan of the GOP [Gornoslaski Okreg Przemyslowy; Upper Silesian Industrial District], 1953-1955
- 10) Plan of the region of Rybnik Industrial District (Okreg Przemyslowy), 1953
- 11) Studies for the regional plan of the Dunaj Basin, 1953
- 12) Study for the regional plan of the Middle Vistula, 1954
- 13) Study of the region of Brda Valley, 1954
- 14) Regional plan of the Bug Valley, 1954
- 15) Regional plan of the Wizna region, 1954
- 16) Studies for the regional plan of the San basin, 1954
- 17) Regional plan of the Lodz Industrial District, 1954
- 18) Regional plan of the Old Polish Basin (Zaglebie Staropolski), 1955
- 19) Regional plan of Zakopane, 1955
- 20) Development program for Goldapski Powiat, 1955
- 21) Regional plan of the Innowroclaw region, 1956
- 22) Regional plan of the Czestochowa Industrial District, 1956
- 23) Regional plan of the Warsaw district, 1956
- 24) Development program of the Leczyca Mining District (Okreg Gorniczy), 1956
- 25) Regional plan of the Wieprz-Krzna Canal, 1956
- 26) Regional plan of Zulawy, 1956
- 27) Regional development plan of Krakow Wojewodztwo, 1956
- 28) Regional plan of the Leba Valley, 1957
- 29) Regional plan of the Ner Valley, 1957

and the industrial grounds of the Upper Silesian Industrial District had been the subject of many studies and investigations, only one modest "Tarnow Study" had been officially adopted. The author writes: "However, only one big study based on penetrating and all-sided investigations--namely, the regional plan of the Upper Silesian Industrial District, made in 1953-1956 and characterized by particularly complex problems--was confirmed by a resolution of the Council of Ministers. Other studies in the form of draft plans and studies for regional plans were to a certain extent utilized by the local and central authorities but did not become a legal basis for making economic decisions, especially investment ones."

It seems that the basic cause of this fact was that the draft regional plans, being naturally of a long-term nature, did not and could not have sufficient economic documentation, exceeding in time the scope of the Six-Year or Five-Year Plan (before 1957 the principle of long-term planning of the development of the national economy was not yet in force).

The confirmation of the space development plan of the Upper Silesian Industrial District is an exception. The attention of both the central and local authorities was focused on the problems of this most important industrial region, constituting a large industrial urban concentration, incorrectly developed (which fact constituted a brake on its further development). For this reason the plan was prepared in the interests of and with the full cooperation of all ministries of national economy and was confirmed as a basis for coordination of investment plans.

Work on the regional plans of other territories was not accompanied by such favorable circumstances of cooperation in the plan or such an intensity of internal inconsistencies as existed in the GOP and which had to be solved. Before 1957 the work on the regional plans did not arouse sufficient, spontaneous interest on the part of the people's councils. It seems that one of the causes of this insufficient interest of people's councils in regional planning was excessive centralization of economic decision-making, limiting the competence of local authorities and therefore weakening their interest in regional planning as a tool of local economic policy.

Of course, this was a circumstance unfavorable to the correct development of regional planning of which the role and practical importance grows with the content of the regional plan and the concept of the economic development of the region as an expression of the attitude of the community of the given region and its authorities.

3. Next, it would be necessary to attract attention to the following disadvantageous phenomenon, which had its source in errors of a methodological and organizational nature of the space planning as a whole. It consists in a large number of already prepared plans for the development of towns, settlements, and villages, without the clear basis connecting and coordinating the development of the settlement network which is provided by regional plans, because for many territories of the country such plans have not previously been prepared. The so-called recommendations of economic planning for local developments plans cannot be considered as a basis replacing the regional plan. Hence the absence of regional plans or the absence of up-to-date drafts of regional plans adversely influenced the solutions in the plans for the development of towns, villages, and other settlements.

4. Despite the undoubtedly great achievements in regional planning during the past 15 years in the form of studies for regional plans and concrete draft plans, which constitute rich material for scientific and theoretical work, we lack a developed theory of regional planning and shaping the economic structure of regions and a theory of the location of productive forces and services, theories proper for People's Poland as a socialist state. The need for such a theory is an indispensable condition for further progress in the development of the methods of regional planning.

5. Underestimation of regional planning in past years has led to the scattering of experienced cadres and an outflow to other work with better remuneration, and in many cases the gaps created were not filled by new properly prepared talents with experience in regional planning.

6. As concerns the legal status of regional planning, a vague situation has prevailed. The 1946 decree on the planned space development of the country is still formally in force, while the conditions of regional planning, including organizational conditions, have been subject to far-reaching changes. Under these circumstances, the urgent need emerges for replacing the 1946 decree with a new basic legal document which would ensure proper importance for regional planning and space planning as a whole and would open new roads of correct development.

Real Premises of the New Current Stage

A clear turning point for the position of regional planning and its further development outlook was marked already in 1957, when the principle of long-term planning became obligatory in Poland.

The principle of long-term planning of the development of the national economy became, in the course of the last few years, an indispensable condition for methodological progress in planning and correct formulation of the so-called multi-year plans (for several years) and annual plans.

In the light of the experiences to date, it turned out that planning of the development of the national economy in stages of at most a few years cannot ensure correct solutions stemming from demographic development or determine the results of investments characterized by a long cycle of realization, often exceeding the time limits of the given multi-year plan--especially in the mining, metallurgical, and chemical industries. Planning for a few years cannot correctly solve problems requiring long-term planning--for example, in the field of water management, forestry, development of the raw material base, formation of the settlement network, etc. Without long-term planning it is not possible to correctly shape the co-operation of the countries of the socialist camp in accordance with the premises of mutual economic, scientific, and technical aid.

The long-term plan of the development of Poland and its individual regions, now under preparation, constitutes an orderly and coordinated synthesis of views based on science and economic practice and concerns the development of the society, technology, and the national economy as a whole in 1961-1975--that is, in a period of 15 years. The accepted 15-year period is a compromise between the stands of the individual branches of the national economy. The hypotheses for the development of the society and the economy for longer periods of time would be too theoretical in the face of the huge progress of science and technology.

Thus, the long-term plan is only a hypothesis of development and for this reason it cannot be a legally enforced plan, confirmed for realization. However, it is a valuable foundation for the formulation of realization plans of single and several years.

It is necessary to deepen and coordinate the long-term plan by using the method of successive approximations; multi-year and annual plans should be treated as differentiated and balanced stages of realization.

The long-term plan is prepared simultaneously both centrally and regionally by wojewodztwos. This method ensures mutual comparison of solutions of individual problems, and periodic summing up of all-embracing regional concepts will provide a foundation for a wide discussion on the central assumptions and for a verification of the long-term plan as a whole.

It also seems that the concepts of space development of the whole country and its regionalization find a foundation for methodically correct solutions only within the framework of work on the entire long-term plan. Thus, the principle of long-term planning facilitates in regional planning the introduction of a fully developed form of all-embracing planning, which is an expression of unity of economic and space planning. The advantages which stem from this for the national economy are obvious.

So far this principle could not be fully applied because regional planning, essentially of a long-term nature, could not independently solve correctly the complex problems of long-term development of the society, technology, economy, and culture in the individual regions of the country, necessarily apart from the national long-term assumptions, because they did not exist.

In the light of the above considerations, it became apparent that the introduction of the principle of long-range planning of the development of the national economy became the most essential real premise of the new stage in regional planning. The positive experiences and achievements of regional planning, enriched by the new methods, will constitute a basis for further progress.

At this point it must be said that the important principle of long-term planning is an expression of the victory of this very idea which was represented by the creators of space planning in Poland and which lies at the foundations of every regional plan.

At the present moment, work on general regional plans is conducted for the areas of wojewodztwos within their administrative borders and has already embraced the territory of the whole country.

In the first stage, the preliminary hypotheses for the development of the wojewodztwos have been prepared. They are now being deepened. In the next stage in 1960 preliminary drafts of regional plans will be prepared. In this work the cartographic method will find a wide application.

Besides the prepared regional plans of whole wojewodztwos, work is also being conducted on detailed regional plans for areas of concentrated multi-year investments, or for under-developed areas requiring activation. These areas do not coincide with the administrative borders of the wojewodztwos but embrace parts of individual wojewodztwos, such as the sulphur region, the Konin-Leczyca region, Bieszczady, and Zulawy.

The map in Figure 2 gives the areas embraced by the regional plans currently prepared--that is, in 1958-1959.

Apart from this work conducted on regional general and detailed plans within the framework of the long-term plan, numerous studies are being made under the supervision of the Committee for the Affairs of Town Planning and Architecture (Komitet do Spraw Urbanistyki i Architektury) for the suburban areas of large towns, groups of towns and settlements, and also so-called settlement-agricultural plans, which, for lack of detailed regional plans, are to constitute the basis for local plans.

All these studies have many of the characteristics of detailed regional plans, although they do not include all the problems of the latter. They can constitute a big and valuable contribution to the regional plans prepared within the framework of the long-term plan and at the same time be subject to enrichment and verification from the point of view of the long-term plan. For this purpose, it is desirable to strengthen and perpetuate the cooperation between all town planning bureaus and the WKPG [Wojewodzka Komisja Planowania Gospodarczego; Wojewodztwo Commission of Economic Planning], and particularly with the establishments for long-term plans.

The map in Figure 3 presents the areas for which plans are being prepared under the supervision of the KUA [Komitet Urbanistyki i Architektury; Committee of Town Planning and Architecture].

In connection with work on regional plans connected with the long-term plan, new methods have been initiated which seem to promise positive results.

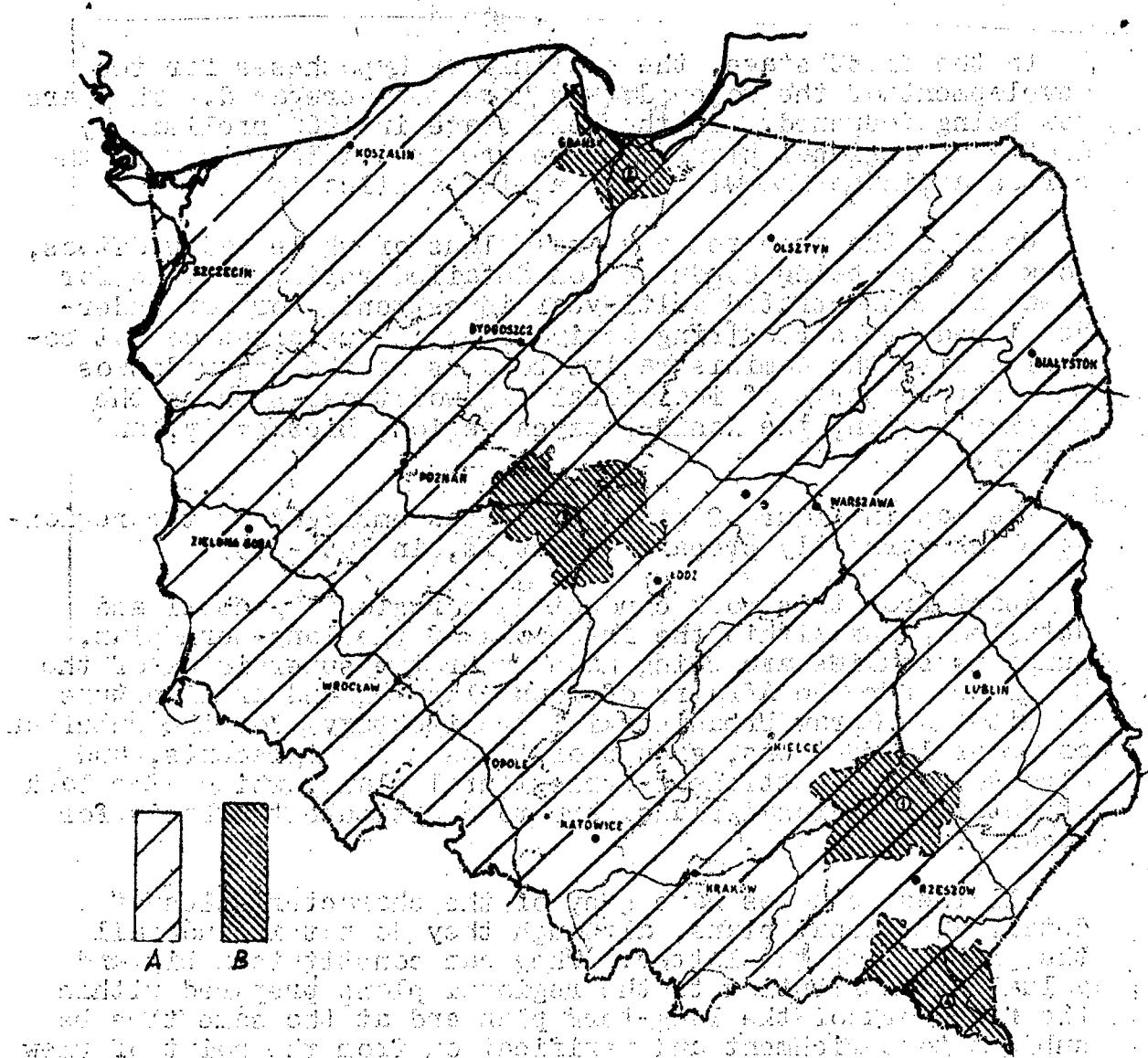


Figure 2 *600* *fm* *horizontal* *displacement*

- A) Territories covered by general regional plans in 1958-1959
- B) Territories covered by detailed regional plans in 1958-1959
- 1) The sulphur region
- 2) Zulawy
- 3) The Konin region
- 4) Bieszczady

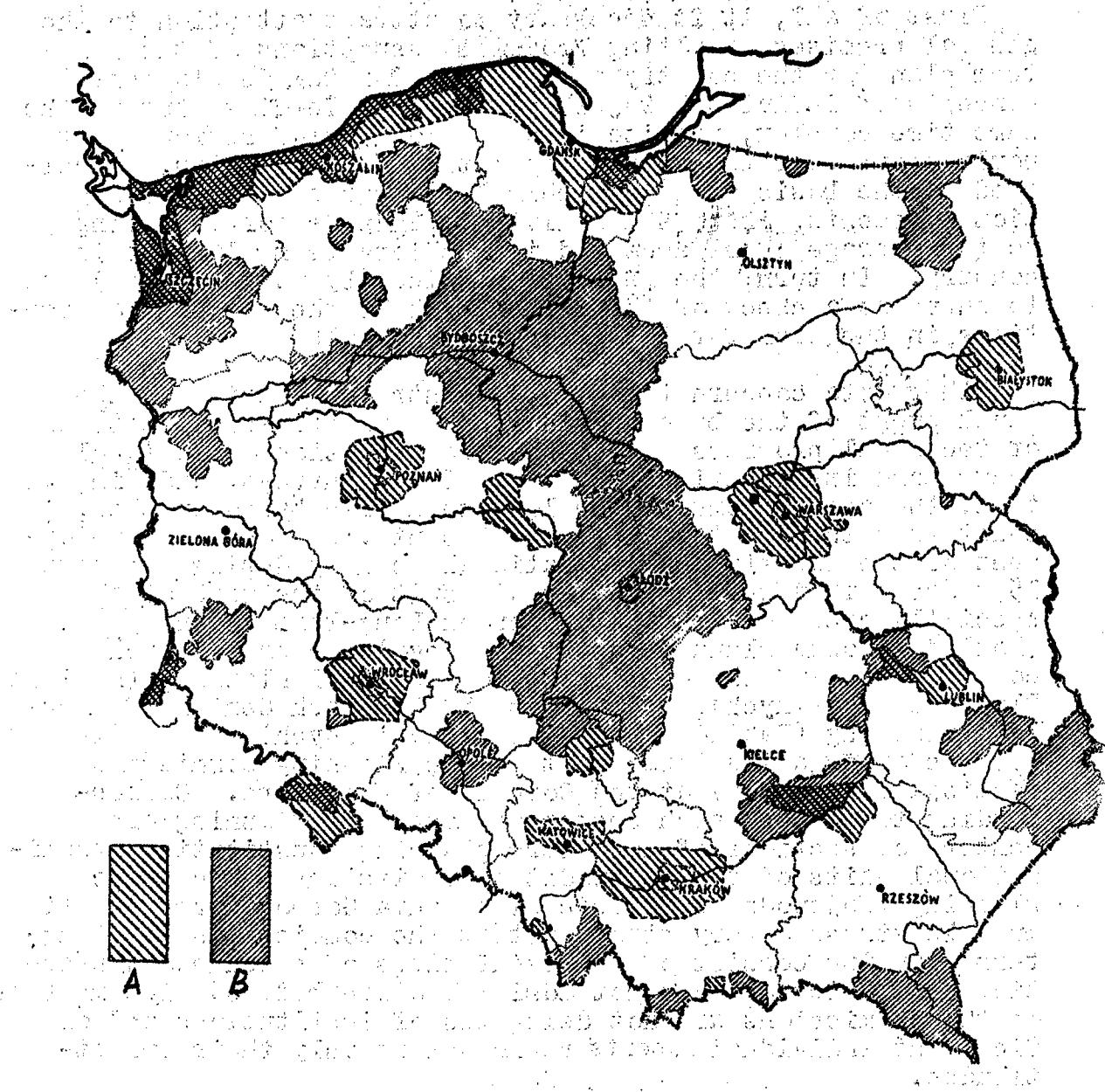


Figure 3

Areas for Which Space Development Plans for Groups of Towns and Settlements Are Being Prepared

First of all, it is necessary to attract attention to the general premises resulting from the assumptions of the long-term plan for the country as a whole, for the development concepts of individual wojewodztwos. The leading, but at the same time complex, premise is a development of regions that would ensure for the future population of the region, calculated on the basis of demographic forecasts and assumed migration movements, incomes and living standards corresponding to the average level accepted in the long-term plan for the country. In turn, the regional studies (by wojewodztwos) are to serve as a check of the correctness of the accepted assumptions in the plan for the country as a whole.

Other data concern the present central surveying of the development of the base of mineral raw materials, directions of technical progress, the long-term formation of national income and its distribution, etc. These surveys, and, in turn, the assumptions of the long-term plan based on them, constitute the sum total of the present views on the development of the society and the national economy during the next 15 years. They were shaped as a result of the work of a specially created Main Commission on Long-Term Planning (Komisja Glowna Planu Perspektywicznego), several branch commissions, and the Commission for Regional Planning (Komisja Planow Regionalnych), as well as the Research Center of Long-Term Planning (Zaklad Planow Perspektywicznych) created in 1957 as an organizational unit of the Planning Commission (Komisja Planowania) at the Council of Ministers. Corresponding to the Research Center of Long-Term Planning are centers or sections of long-term planning constituting organizational units of the Wojewodztwo Commissions of Economic Planning (Wojewodzkie Komisje Planowania Gospodarczego). It must be stressed very strongly that the commissions for long-term planning consist of representatives of science and practical economics and are not administrative bodies. The members of the commissions are not delegates of institutions and offices but individual experts representing only their own attitudes.

As was already mentioned above, the first stage of work on the regional plans in the form of preliminary concepts for the long-term development of the wojewodztwos has already been completed. Its result is extensive (mimeographed) material in texts and maps. It contains the current analysis of the state of development of wojewodztwos, an attempt to determine the function of the given wojewodztwo within the economy of the entire country, taking into account its special regional

and, of course, the ability to formulate a basic regional characteristics, evaluating the living conditions of the population, making a preliminary evaluation of the development possibilities of individual sections of the economy, outlining the program for production, services, investments, and development of settlement network.

The Commission for Regional Plans evaluated these studies very positively as a first attempt to formulate from below the concept for the economic and social development of each wojewodztwo, and therefore an attempt to make a summation which would give, for the first time, a total of local views on the long-term development concept of the whole country. An attempt to make such a summation is now going on.

Despite the general positive evaluation of this rich material, the Commission for Regional Planning also called attention to its shortcomings. They concern first of all the excessive differences in editorial treatment, the insufficiently prepared economic structure of regions and inter-regional ties, the incomparability of cartographic and some statistical materials, etc. These shortcomings are being removed in the present stage of work.

Despite these shortcomings, the results of the work to date constitute a material which is an expression of the correctness of treating regional planning as an integral part of long-term planning. Poland took the first decisive step in the formation of new methods of regional planning; so far this has no precedent in other countries and for this reason it is of special interest.

An expression of progress in the method of regional planning is the creation of two regional commissions whose task is to solve the problems of regional plans in which the given wojewodztwos are mutually interested and which they cannot solve by themselves, within the limits of their territorial competences, without harming the cause. I have in mind here the Commission for Long-Range Planning of the Maritime Region (Komisja Planu Perspektywicznego Regionu Morskiego) embracing four northern wojewodztwos--Szczecin, Koszalin, Gdansk, and Olsztyn--and the Silesian-Krakow Commission (Komisja Slasko-Krakowska), embracing the Katowice, Krakow, and Opole Wojewodztwos. The work of the Commission of the Maritime Region is very advanced and that of the Silesian-Krakow Commission is still in an initial stage. In the light of the present course of work and its results, it can be expected that the work of these commissions may be very fruitful and, among other things, may contribute much to the problem of purposeful inter-regional ties.

An appreciated requirement of the method of regional planning is also the current coordination of detailed regional plans with the regional plans of wojewodztwos.

Attention should also be given to the positive practice of seminary meetings organized by the Research Center of Long-Term Planning for the employees of centers (sections) of long-term planning of the WKPG, dealing with subjects connected with the method of preparing individual stages and individual parts of regional plans of wojewodztwos and syntheses of these studies. Such seminaries take the form of free exchange of views and discussion and provide valuable material which, with proper editorial treatment and in mimeographed form, is used by regional planning employees and helps in their further work.

The results of the work to date bring up many important problems the correct solution of which requires investigations and special studies.

The most important are the problems of the method of analysis and planning of rational inter-regional ties, the method of economic evaluation of space solutions (economic calculation in space planning), the method of analyzing and forming the internal structure of regions, a developed cartographic method as a particularly important tool of work in regional planning, and several others, in addition to the already indicated need for urgent development of work in the field of the theory of regional planning and location of productive forces and services.

Of course the apparatus of regional planning is unable to solve these problems by itself. Constant and consistent help on the part of science is required for this purpose. For this reason it is necessary to stress with special recognition the creation of the Committee for Space Development of the Country (Komitet Zagospodarowania Przestrzennego Kraju) within the framework of the Polish Academy of Sciences (Polska Akademia Nauk), which has already started numerous inventory, scientific research, and theoretical undertakings aimed at the development of a scientific basis for space planning.

Together with the crucial element for the development of regional planning, which is the principle of long-term planning of the development of the society and the national economy, the second basic element is, in my opinion, the wide participation of PAN [Polska Akademia Nauk; Polish Academy of Sciences] in the formulation of methods of space planning.

This is the second favorable premise of the new stage.

Regional planning is becoming better understood in the countries of the socialist camp as an important tool of planned formation of the social and economic development of regions and of disclosing and utilizing in a ration way their potential possibilities and reserves. This should explain the intensified contacts with abroad, the postulates for exchange of experiences in the application of methods of regional planning, the location of investments, mutual utilization of scientific research work and all experiences of regional planning, including methods of training and improving cadres.

For these reasons, the Section of Regional and Town Planning (Sekcja Planowania Regionalnego i Urbanistyki) was created within the framework of the Permanent Construction Commission (Stala Komisja Budownictwa) of the Council for Mutual Economic, Scientific, and Technical Aid (Rada Wzajemnej Pomocy Gospodarczej i Naukowo-Technicznej) of the socialist countries. The headquarters of the administration and secretary of the Section are in Budapest. The Section, although it has been in existence for only a year and a half, can already boast of some achievements which are now being prepared for incorporation into the practice of regional planning. The results of the work of the Section to date and the planned undertakings would require a separate discussion. However, at this point it is worth while at least to call attention to four important problems in the work of the Section, which to a certain extent will influence the development of regional planning in Poland.

The first is the problem of development of methods of coordination of regional plans of certain areas of neighboring countries. In this field there is the necessity not only of utilizing mutually the methods of past solutions of problems in concrete regional plans, but also of reaching an agreement concerning several common problems expressed in the regional plans of neighboring areas, such as the problem of water economy, of transport and power systems, the location of industry and rest areas, and many others. Work in this field has been taken up jointly by Poland and Czechoslovakia.

The second important problem is the use of economic calculation in regional planning. This is an extremely complex and difficult matter and concerns the finding of effective methods of economic documentation of space solutions in their all-

embracing treatment. The first steps in treating this matter as a problem for discussion were made by the Association of Polish Town Planners (Towarzystwo Urbanistow Polskich), which in 1957 organized a conference with a lecture by Prof Dr W. Lisowski and Director J. Kolipinski. They delivered the following lectures: J. Kolipinski: "General Principles of Economic Calculation in Regional Planning;" and W. Lisowski: "Methods of Economic Calculation in Long-Term Regional Planning."

At present this matter, as an important element of methodological progress in regional planning, has been included in the program of work of the Section, and the Polish delegation is also represented in the working group of experts.

The third important problem is the development and improvement of the methods of planning of the settlement section as a complex function of development of the productive forces in regions with various conditions of geographic environment and various social and economic conditions. On this matter views and experiences were exchanged and recommendations for planning practice were accepted.

The fourth important matter is the recommendation of the Section of Regional and Town Planning for setting in order the legal foundations of regional planning in each of the CEMA member countries. It turns out that in the majority of socialist countries (except Czechoslovakia) the existing legal foundations of regional planning are obsolete and do not correspond to the current needs and requirements.

This outline of the new outlook for regional planning in Poland is clearly optimistic.

This accent of optimism can be strengthened still more by recalling that in recent years the people's councils were given much more authority than they enjoyed previously. In connection with this, their interest in regional planning increased. In particular, the presidium of the wojewodztwo people's councils appreciated more and more the need for preparing general and detailed regional plans for the areas subordinated to them. They understood that an all-embracing, long-term treatment of the problems of development of their wojewodztwos and individual parts of wojewodztwos was a good tool of coordination and a basis for the proper preparation of multi-year and annual plans. Thus the atmosphere for regional planning in wojewodztwos is favorable, especially since in certain wojewodztwos cooperation is enjoyed not only with

individual organizations of the presidiums of wojewodztwo people's councils but also with regional scientific, organizational, economic, and other bodies.

Much less optimistic are the means for regional planning in comparison with the scope of tasks and needs. The tasks will undoubtedly grow, especially since today the need has already become apparent for expanding regional planning from the scale of the wojewodztwo and areas of concentrated investments so as to embrace the powiats.

This is especially important for the correct solution of several agricultural problems, such as regionalization of agricultural production, correct preparation of local settlement-agricultural plans, solution of the function and role of small towns, and several other important problems on the powiat scale.

Among the most important, but clearly lacking, means is the state of cadres of regional planners.

Unfortunately, theoretically well prepared, experienced, and highly skilled cadres are very scarce. They are partly employed outside regional planning on better paid jobs in the local apparatus subordinate to the KUA, in designing bureaus, partly in scientific work, etc. Hence also the problem of providing salaries for highly skilled regional planners that will counteract excessive mobility of cadres in the units of regional planning requires a positive solution. Young cadres are more numerous but in most cases lack training in the methods of regional planning.

In connection with this a serious problem of training emerges. It seems necessary to prepare a special plan for training cadres of regional planners, the number, professional composition, and territorial distribution of which should be based on a penetrating analysis of the existing situation and calculated needs. An effective training method, although not the only one, is the method of improvement studies, partly by mail. A preliminary plan for such a two-year course of study for the present employees of long-term planning centers of the wojewodztwo economic planning commissions has been prepared. Certain local wojewodztwo authorities individually consulted on this matter spoke for the desirability of the study and offered their support.

A second key problem for speedy solution and settlement is the replacement of the 1946 decree on planning space development of the country by a proper legal act. Since work on the draft of such an act is in progress, it can only be hoped that will be finished and agreed upon in time for the proposed act to be debated during the spring session of the Parliament (Sejm).

An important matter is the problem of improvement of organization of regional planning and of the technique of organizational work, including also cooperation in the preparation of regional plans.

Constructive help in raising the level of regional planning can be provided by the Association of Polish Town Planners and particularly by its Section of Regional Planning (Sekcja Planowania Regionalnego) as a forum for expert discussion.

POLAND

A New Domestically Produced Automatic Switch

[This is a translation of an article by Engr Tadeusz Iwanowski in Wiadomosci Electrotechniczne, Vol XX, No 1, January 1960, Warsaw, pages 13-15; CSO: 3772-N/a]

This year the "Elan" Plant is launching the production of a new type WIS 100 A automatic switch in a bakelite housing, which is able to interrupt short-circuit currents up to 10 kilo-amperes (at 500 volts alternating current). This switch will meet the technical standards of the Soviet-made type A 3120 device.

The switch in question is provided with a combination thermal over-current and magnetic release, to which a remotely controlled blowout coil and auxiliary contacts can be added at the buyer's request. The contacts of the device are made of special materials obtained by baking pulverized silver, nickel, and graphite, which guarantees a high durability of the contacts as well as high resistance to the action of the electric arc.

The type WIS switch can also serve direct current circuits; however, this should be noted on the order. The type WIS 100 switch is the first switch of the series which will be produced by the plant.

The following are the next sizes of the above series, of similar design and housing:

WIS 50 A, 500 volts AC, 220 volts DC
WIS 200 A, 500 volts AC, 220 volts DC
WIS 400 A, 500 volts AC, 220 volts DC
WIS 600 A, 500 volts AC, 220 volts DC

These will appear in the next few years (1960-1964). The technical data for the following switch sizes will be released by the plant as the switches are put into production.

Switches of similar design are manufactured by the "Merlin Gerin," "Sace," and Westinghouse firms and are commonly applied in electrical systems all over the world, under normal as well as difficult operating conditions, such as those prevailing in

mines, on ships, etc. The type WIS switches, in view of the manifold methods of attaching them to the supporting structure, can be installed in open or dead-front panelboards or mounted on the side, depending on the particular requirements.

The principal technical data are presented below.¹

1. Range of Releases:

- a) Combination release (which includes a thermal time delay element and an instantaneous magnetic element)
- b) Magnetic release

The operating time of the thermal time delay element of the combination release meets the VDE [Verein Deutscher Elektriker] 0660/12.52 standard specifications. The recovery time of the thermal release, which makes reclosing possible, is 2.5 minutes.

2. Rate Short-Circuit Interruptability:

- a) Direct current $T = 0.01$ seconds
- b) Alternating current $f = 50 \dots 50$ Hertz $\cos \phi = 0.5$
interrupting time $= 10$ to 20 seconds

3. Mechanical and Contacting Durability = $10,000$ contact operations

More detailed information on the above switches can be obtained from the Lodz "ELAN" Electric Switchgear Plant, Praska Street 15/17, Lodz, Telephone 405-27.

Table 1

Rated Trip Current	A	Trip Setting for Instantaneous Operation (AC & DC)	A
15, 20, 25, 70		430	
40, 50, 60		600	
80, 100		800	

Table 2

<u>Rated Trip Current</u>	Trip Setting for Instantaneous Operation	
	DC	AC
(in amperes)		
100	-	430
100	600	600
100	800	800

Table 3

<u>Rated Trip Current</u>	Maximum Short-Circuit Current at 220 volts, in amperes	<u>Maximum Number of Interruptions</u>
15	10,000	
20	12,000	
25	14,000	12
30 + 100	16,000	

Table 4

<u>Rate Trip Current</u>	Short-Circuit Rupturing Current, in Volts			<u>Minimum Number of Interruptions</u>
	220	380	500	
15	7,000	5,500	4,000	
20	7,500	6,000	5,000	
25	11,000	9,000	7,000	12
30	12,000	10,000	8,000	
40	15,000	13,000	10,000	
50	22,000	19,000	14,000	
60	23,000	20,000	15,000	7
80	26,000	22,000	16,000	
100	30,000	23,000	18,000	

Footnote

¹Data according to technical specifications of Type A3120 circuit-breaker of Soviet production.

POLAND

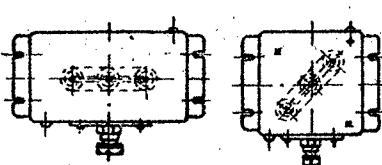
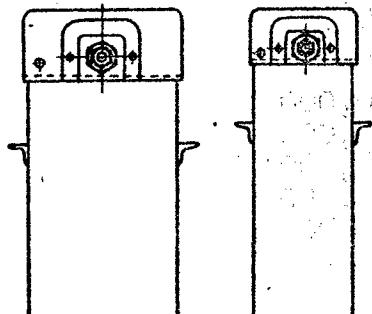
Domestically Produced Condensers for
Raising the Power Coefficient

[This is a translation of an article by Engr Marian Urbaniec, in *Wiadomosci Elektrotechniczne*, Vol XX, No 1, January 1960, Warsaw, pages 15-16; CSO: 3772-N/b]

The problem of increasing the power factor in power equipment is generally well known. Therefore, the subject of this article is limited to presenting the general technical data on domestically produced power condensers.

The large assortment of condensers produced by the "Telpod" Telecommunication Devices Manufacturing Plants in Krakow, 4 Lipcowa Street, makes their application possible in almost every power system.

Thus type KSTA indoor condensers are designed for operating voltages of 220, 380, 500, 3,000, 3,030, 3,640, 6,000, and 6,060 volts, for 50-Hertz alternating current electrical equipment (28 sizes). In 1960 the production of this type of condenser for an operating voltage of 9,090 volts and a capacity of 25 kilovars [will be launched].



1

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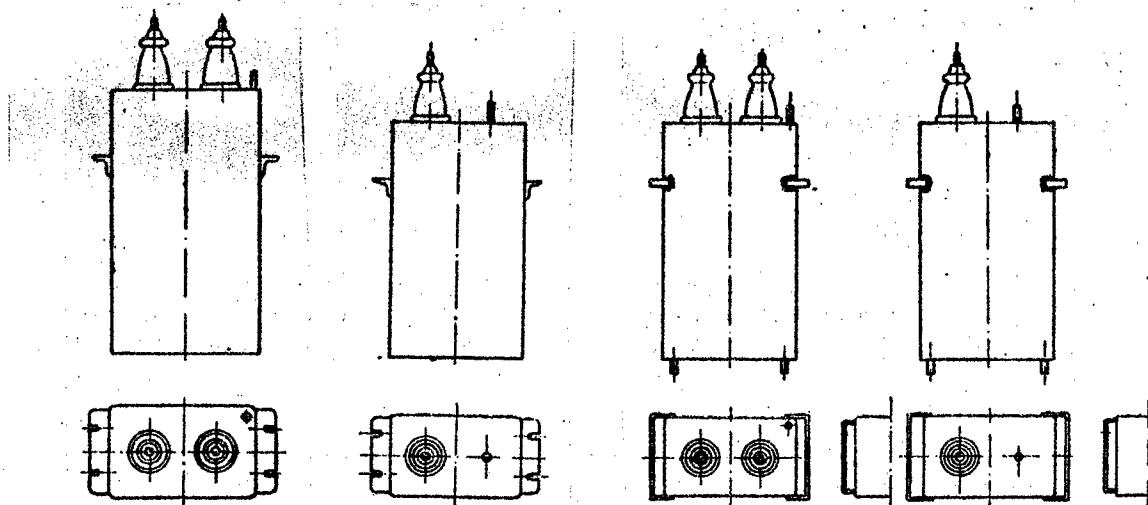
Condensers for voltages up to 500 volts are produced in units of 2.5, 5, 7.5, 10, 15, 20, and 25 kilovars, three-phase delta connection (14 sizes); 2.5-, 5-, and 7.5-kilovar units are produced for operating voltages of 380 and 500 volts and are most frequently used for compensating small individual motors, as well as a no-load current of transformers.

Figures 1 and 2: Type KSTA Three-Phase Indoor Condensers--1) 220 to 500 volts, 10 to 25 kilovars (simple pole arrangement); 2) 380 volts, 2.5 to 8 kilovars (oblique pole arrangement)

Protective shields are used (on special order) for condensers up to 500 volts, with the purpose of protecting people from incidental contact of parts under voltage (Figures 1 and 2). Such protection is especially recommended in the case of individual unit compensation.

Condensers for operating voltages of 3,000 to 6,060 volts are manufactured in single-phase units of 10, 20, 25, and 33.3 kilovars (14 sizes), whereby they can also be made with two insulated poles as type KSTA-I, or with one insulated pole and the second one permanently connected to the housing, such as in type KSTA-E.

In order to make possible the mounting of condensers on supporting structures, they are produced in two versions: version "A" (Figures 3 and 4) and version "B" (Figures 5 and 6).



Figures 3 and 4: Indoor Single-Phase Condenser in "A" Version

- 3) Type KSTA-I, 2,200 to 6,600 volts, 10 to 33.3 kilovars
- 4) Type KSTA-E, 2,200 to 6,600 volts, 10 to 33.3 kilovars

Figures 5 and 6: Indoor Single-Phase Condenser in "B" Version

- 5) Type KSTA-I, 2,200 to 6,600 volts, 10 to 33.3 kilovars
- 6) Type KSTA-E, 2,200 to 6,600 volts, 10 to 33.3 kilovars

On special order, the "Telpod" Plant can produce three-phase condensers for operating voltages up to 6,000 volts.

Type KEZ (17 sizes) condensers are produced for aerial installations, for series as well as parallel compensation. These units can also be made with two insulated poles, as in Type KEZ-I (Figure 7), and with one insulated pole and one permanently connected to the housing, as in Type KEZ-E (Figure 8).

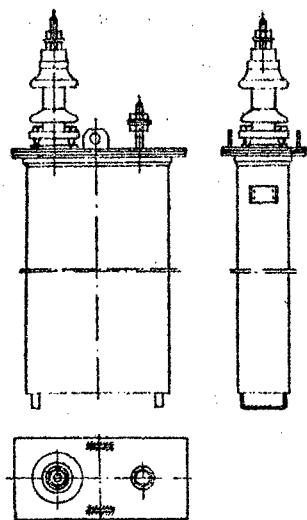


Figure 7. Type KEZ-I
Single-Phase Condenser
for Aerial Installation

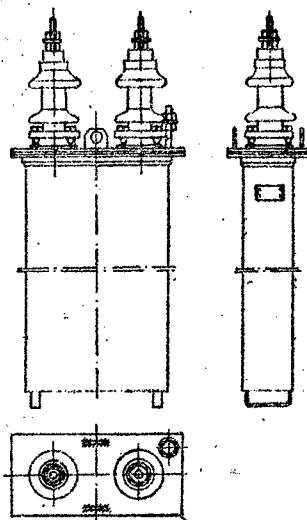


Figure 8. Type KEZ-E
Single-Phase Condenser
for Aerial Installation

Type KEZ condenser units are produced for operating voltages of 1,000, 2,000, 3,000, 3,030, 3,640, 4,000, and 5,000, 6,000, and 6,060 volts, and 20 and 25 kilovar capacities. The production of condensers for aerial installations, operating voltages of 9,090 volts, and 25-kilovar capacity will be launched in 1960. The "Telpod" Plants are able to put out condensers for other operating voltages; however, they must be ordered with advance agreement with the designing department of the plant. The produced type KSTA condensers meet the requirements of the RN-58/MPC-14001 norms, while the type KEZ condensers also meet the WT-58/E-16103 technical specifications. The above specifications can be obtained from the "Telpod" Plant on written request.

- END -

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